

SCAVENGER HUNT

Review Game



Group 1

Materials needed:

- Lined paper
- Scavenger hunt cards
- Calculators

Directions:

First, decide who in the group will be the **messenger**, **timekeeper**, and **researcher**.

Next, solve the problem on the bottom of this paper. There are Key Ideas on the back of each card, but if your group gets stuck, the **researcher** is responsible for looking in a book to help your group find the solution. The **timekeeper** makes sure that your group finds the solution in the time limit given. Once each group member has shown all work on the lined paper, and arrived at the same solution, the **messenger** retrieves the next card by using your group's solution.

Once you have completed all the cards, your group is finished!

A Sketch a cylinder.



Your first card will look like this!

SCAVENGER HUNT

Review Game



Group 2

Materials needed:

- Lined paper
- Scavenger hunt cards
- Calculators

Directions:

First, decide who in the group will be the **messenger**, **timekeeper**, and **researcher**.

Next, solve the problem on the bottom of this paper. There are Key Ideas on the back of each card, but if your group gets stuck, the **researcher** is responsible for looking in a book to help your group find the solution. The **timekeeper** makes sure that your group finds the solution in the time limit given. Once each group member has shown all work on the lined paper, and arrived at the same solution, the **messenger** retrieves the next card by using your group's solution.

Once you have completed all the cards, your group is finished!

A Sketch a rectangular pyramid.



Your first card will look like this!

SCAVENGER HUNT

Review Game



Group 3

Materials needed:

- Lined paper
- Scavenger hunt cards
- Calculators

Directions:

First, decide who in the group will be the **messenger**, **timekeeper**, and **researcher**.

Next, solve the problem on the bottom of this paper. There are Key Ideas on the back of each card, but if your group gets stuck, the **researcher** is responsible for looking in a book to help your group find the solution. The **timekeeper** makes sure that your group finds the solution in the time limit given. Once each group member has shown all work on the lined paper, and arrived at the same solution, the **messenger** retrieves the next card by using your group's solution.

Once you have completed all the cards, your group is finished!

A Sketch a rectangular prism.



Your first card will look like this!

SCAVENGER HUNT

Review Game



Group 4

Materials needed:

- Lined paper
- Scavenger hunt cards
- Calculators

Directions:

First, decide who in the group will be the **messenger**, **timekeeper**, and **researcher**.

Next, solve the problem on the bottom of this paper. There are Key Ideas on the back of each card, but if your group gets stuck, the **researcher** is responsible for looking in a book to help your group find the solution. The **timekeeper** makes sure that your group finds the solution in the time limit given. Once each group member has shown all work on the lined paper, and arrived at the same solution, the **messenger** retrieves the next card by using your group's solution.

Once you have completed all the cards, your group is finished!

A Sketch a hexagonal pyramid.



Your first card will look like this!

SCAVENGER HUNT

Review Game

Group 5

Materials needed:

- Lined paper
- Scavenger hunt cards
- Calculators



Newton

Directions:

First, decide who in the group will be the **messenger**, **timekeeper**, and **researcher**.

Next, solve the problem on the bottom of this paper. There are Key Ideas on the back of each card, but if your group gets stuck, the **researcher** is responsible for looking in a book to help your group find the solution. The **timekeeper** makes sure that your group finds the solution in the time limit given. Once each group member has shown all work on the lined paper, and arrived at the same solution, the **messenger** retrieves the next card by using your group's solution.

Once you have completed all the cards, your group is finished!

A Sketch a triangular pyramid.



Your first card will look like this!

SCAVENGER HUNT

Review Game



Group 6

Materials needed:

- Lined paper
- Scavenger hunt cards
- Calculators

Directions:

First, decide who in the group will be the **messenger**, **timekeeper**, and **researcher**.

Next, solve the problem on the bottom of this paper. There are Key Ideas on the back of each card, but if your group gets stuck, the **researcher** is responsible for looking in a book to help your group find the solution. The **timekeeper** makes sure that your group finds the solution in the time limit given. Once each group member has shown all work on the lined paper, and arrived at the same solution, the **messenger** retrieves the next card by using your group's solution.

Once you have completed all the cards, your group is finished!

A Sketch a pentagonal prism.



Your first card will look like this!

SCAVENGER HUNT

Review Game



Group 7

Materials needed:

- Lined paper
- Scavenger hunt cards
- Calculators

Directions:

First, decide who in the group will be the **messenger**, **timekeeper**, and **researcher**.

Next, solve the problem on the bottom of this paper. There are Key Ideas on the back of each card, but if your group gets stuck, the **researcher** is responsible for looking in a book to help your group find the solution. The **timekeeper** makes sure that your group finds the solution in the time limit given. Once each group member has shown all work on the lined paper, and arrived at the same solution, the **messenger** retrieves the next card by using your group's solution.

Once you have completed all the cards, your group is finished!

A Sketch a triangular prism.



Your first card will look like this!

SCAVENGER HUNT

Review Game



Group 8

Materials needed:

- Lined paper
- Scavenger hunt cards
- Calculators

Directions:

First, decide who in the group will be the **messenger**, **timekeeper**, and **researcher**.

Next, solve the problem on the bottom of this paper. There are Key Ideas on the back of each card, but if your group gets stuck, the **researcher** is responsible for looking in a book to help your group find the solution. The **timekeeper** makes sure that your group finds the solution in the time limit given. Once each group member has shown all work on the lined paper, and arrived at the same solution, the **messenger** retrieves the next card by using your group's solution.

Once you have completed all the cards, your group is finished!

A Sketch a **cone**.



Your first card will look like this!

Scavenger Hunt Review Game

Objectives:

The student will

- A. identify the given solid
- B. construct a stem-and-leaf plot
- C. write and solve a proportion
- D. evaluate an expression involving exponents and absolute value
- E. write and solve two-step equations
- F. graph two points and find the slope of the line
- G. write and simplify an expression involving fractions
- H. convert between systems of measurement and calculate the surface area of a solid
- I. graph figures in a coordinate plane and determine which two figures are similar

Materials:

- student directions (one for each group)
 - Group 1 (cylinder)
 - Group 2 (rectangular pyramid)
 - Group 3 (rectangular prism)
 - Group 4 (hexagonal pyramid)
 - Group 5 (triangular pyramid)
 - Group 6 (pentagonal prism)
 - Group 7 (triangular prism)
 - Group 8 (cone)
- review cards (Fold each card vertically so the crease is on the left. Then fold each card horizontally so the crease is on the bottom.)
 - 8 sets (one for each group)
 - 2 decoy sets
- Solution I (the last solution, which is the same for all groups)
- lined paper
- calculators

Procedure:

The students will work in groups to solve 9 problems. There are 8 unique sets of cards and 2 decoys. The students will work in a group of 3-4 students depending on the number of students in the class since there can be at most 8 groups.

The first question is on the directions page. (As the students work, be sure each student is showing all work on lined paper.) From there, the students are able to find the

next card based on the solution. Once they have checked their answer, they can solve the next problem. The students can check their solution by matching the solid on the inside of the card, with the solid assigned to the group from the directions page.

Each card has the worked out solution from the previous problem. Each card also has Key Ideas on the back in case the student needs a little review.

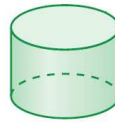
In each group, there should be a time keeper, messenger and a researcher. The time keeper uses the clock on the time on the card and watches the clock to make sure the group finishes the problem within the given time. It is also his or her job to keep the group on task. The messenger is responsible for retrieving the next card and checking the group's solution on the card. Each student is responsible for showing all work on lined paper. The researcher is responsible for looking up how to solve the problem if the students cannot figure it out as a group.

The activity is completed when each group has completed all questions correctly.

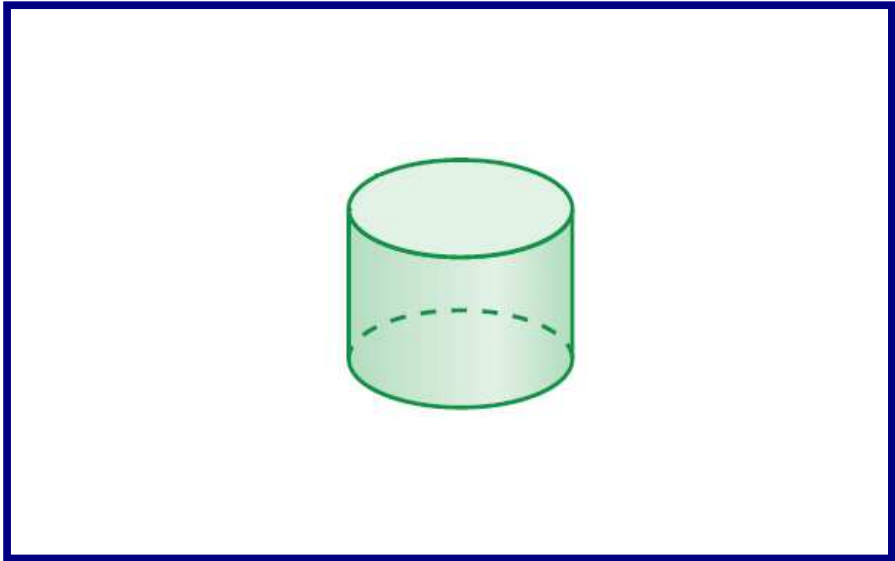
This activity should take about 30 minutes if the students solve the problems within the time limit given on each card.

A Solution:

A *cylinder* is a solid that has two parallel, identical circular bases. So, the solid shown is a cylinder.



Each card for your group should have this solid. If you do not see a cylinder, go back and try again.

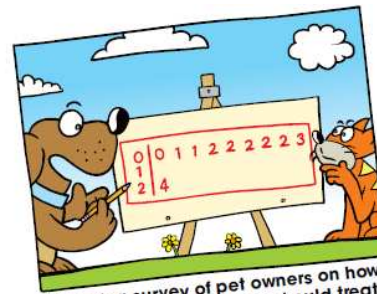


B Make a stem-and-leaf plot of the number of songs downloaded.

Songs Downloaded			
20	14	5	34
45	25	20	18
16	12	31	9

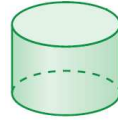


Your next card will look like this!



"I took a survey of pet owners on how many times per day you should treat your dog to a biscuit."

Key Idea
A **stem-and-leaf** plot uses the digits of the data values to organize a data set. Each data value is broken into a stem (digit or digits on the left) and a leaf (digit or digits on the right).

B**Solution:**

To make a stem-and-leaf plot:

1. Order the data.
2. Choose the stems and the leaves. Because the data values range from 5 to 45, use the *tens* digits for the stems and the *ones* digits for the leaves.
3. Write the *stems* to the left of the vertical line.
4. Write the *leaves* for each stem to the right of the vertical line.

The stem-and-leaf plot is shown on the front with a title and a key.

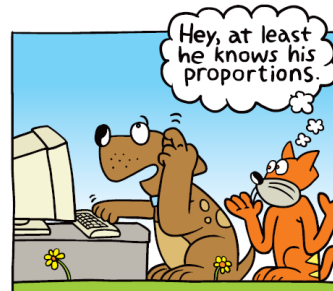
Songs Downloaded

Stem	Leaves
0	5 9
1	2 4 6 8
2	0 0 5
3	1 4
4	5

Key: 1 | 4 = 14 songs

C

It costs \$37.50 for 5 tickets to the movies. Write and solve a proportion to determine how much 8 tickets will cost.



"I got 15 on my online test. That's 105 in dog points! Isn't that an A+?"



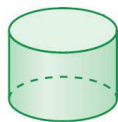
Your next card will look like this!

Key Ideas

A **proportion** is an equation stating that two ratios are equivalent.

To solve a proportion, use the **Multiplication Property of Equality** or the **Cross Products Property**.

C Solution:



First, write a proportion.

$$\frac{37.50}{5} = \frac{x}{8}$$

← dollars
← tickets

$$37.50 \cdot 8 = 5 \cdot x \quad \text{Cross Products Property.}$$
$$300 = 5x \quad \text{Multiply.}$$
$$60 = x \quad \text{Divide.}$$

So, it will cost \$60 for 8 tickets to the movies.



D Evaluate the expression

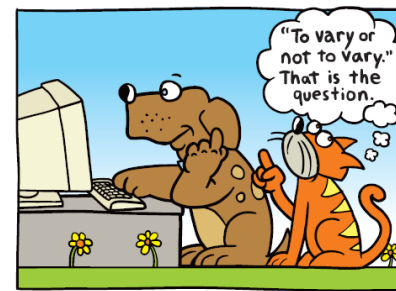
$$x^2 - |y - 2| + \frac{12}{x}$$

when $x = -3$ and $y = 1$.



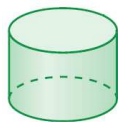
Your next card will look like this!

Key Idea
Use the *order of operations* when evaluating an expression.



"Dear Sir: Yesterday you said $x = 2$.
Today you are saying $x = 3$.
Please make up your mind."

D Solution:

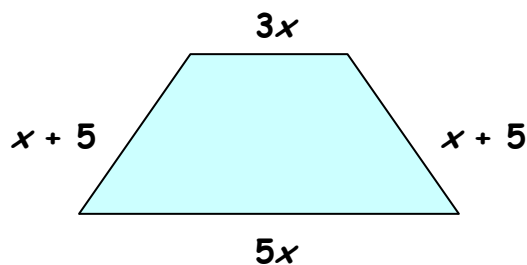


Use substitution for $x = -3$ and $y = 1$.

$$\begin{aligned} & x^2 - |y - 2| + \frac{12}{x} \\ &= (-3)^2 - |(1) - 2| + \frac{12}{-3} \\ &= 9 - |-1| + (-4) \\ &= 9 - 1 + (-4) \\ &= 9 + (-1) + (-4) \\ &= 4 \end{aligned}$$



E The perimeter of the trapezoid is 40.
What is the value of x ?



Your next card will look like this!

Key Ideas

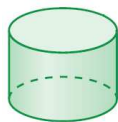
The perimeter of a figure is the sum of the sides.

To solve an equation:

- combine like terms
- undo addition and subtraction
- undo multiplication and division



E Solution:



$P =$ Sum of all sides

$$40 = (x + 5) + 3x + (x + 5) + 5x$$

$$40 = 10x + 10$$

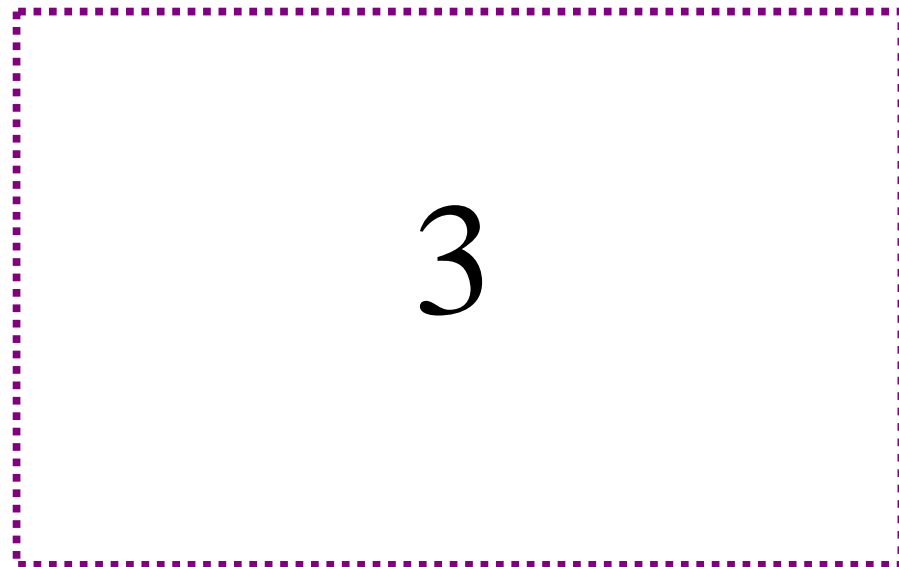
$$\color{red}{-10} \quad \color{red}{-10}$$

$$30 = 10x$$

$$\frac{\color{red}{30}}{\color{red}{10}} = \frac{\color{red}{10x}}{\color{red}{10}}$$

$$3 = x$$

So, the value of x is 3.



F Graph the line that passes through the two points $(-2, 2)$ and $(4, 6)$. Then find the slope of the line.



"I am doing an experiment with slope. I want you to run up and down the board 10 times."



Your next card will look like this!

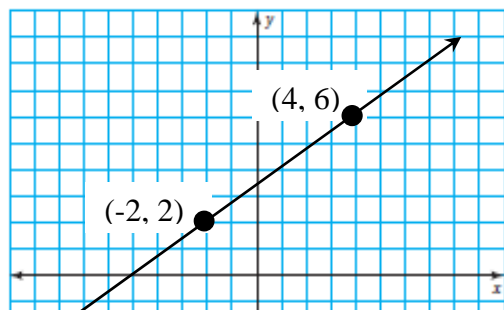
Key Ideas

An **ordered pair** (x, y) is a pair of numbers that is used to locate a point in a coordinate plane.

Slope is the rate of change between any two points on a line.

To find the **slope** of a line, find the ratio of the vertical change to the horizontal change.

F

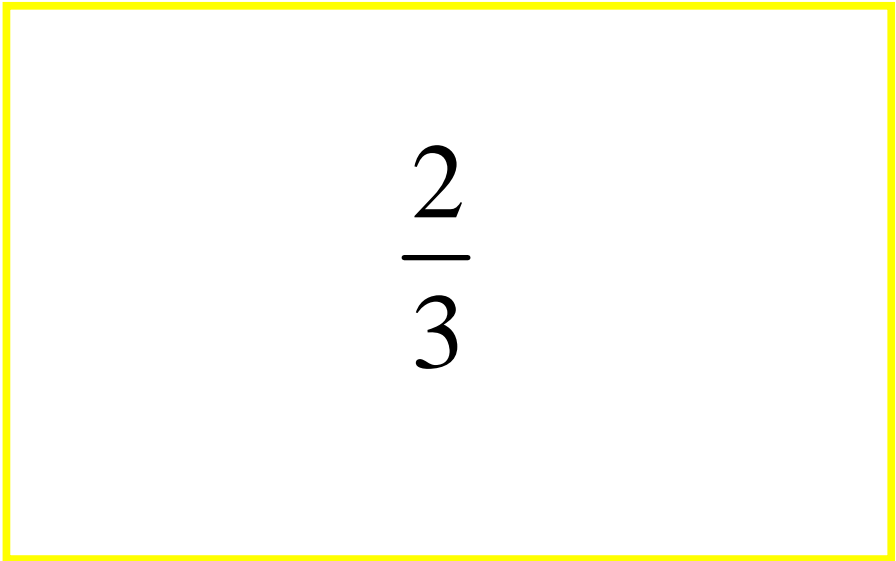


Solution:

The two points are plotted as shown.

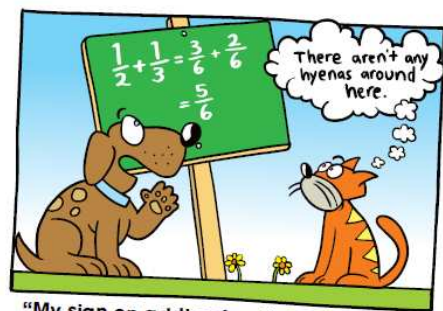
$$\text{Slope: } \frac{\text{change in } y}{\text{change in } x} = \frac{2}{3}$$

So, the slope is $\frac{2}{3}$.



G What is the difference of

$$1\frac{4}{5} \text{ and } -3\frac{3}{10}?$$



"My sign on adding fractions with unlike denominators is keeping the hyenas away."



Your next card will look like this!

Key Ideas

To subtract a rational number, add its *opposite*.

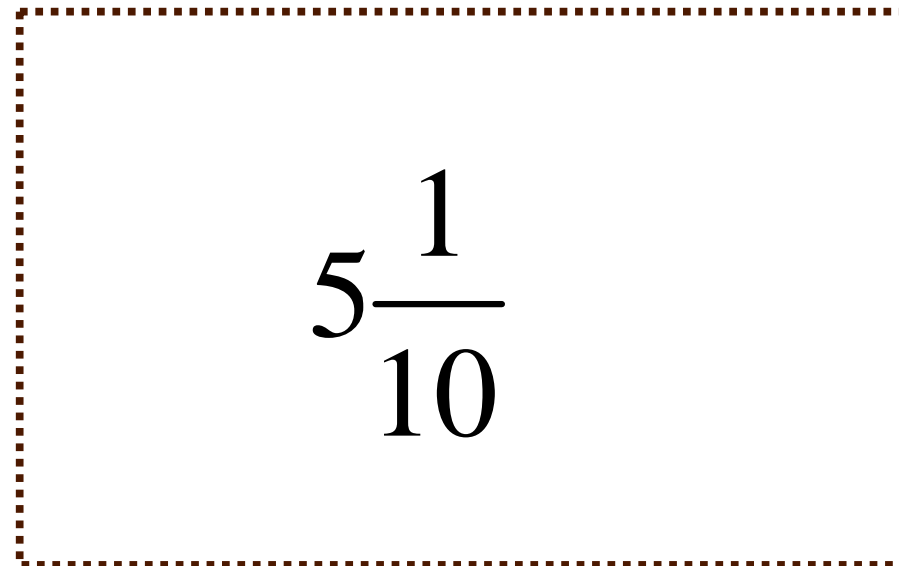
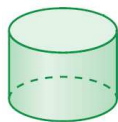
To add rational numbers, rewrite each number using the **LCD** (least common denominator), add the numerators and simplify.



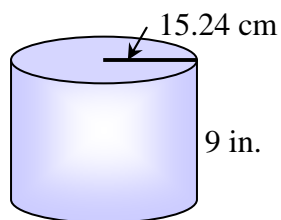
G Solution:

$$\begin{aligned} & 1\frac{4}{5} - \left(-3\frac{3}{10}\right) \\ &= 1\frac{4}{5} + 3\frac{3}{10} \\ &= \frac{9}{5} + \frac{33}{10} \\ &= \frac{18}{10} + \frac{33}{10} \\ &= \frac{51}{10} \\ &= 5\frac{1}{10} \end{aligned}$$

So, the difference is $5\frac{1}{10}$.



H Find the surface area of the cylinder in square inches. Round your answer to the nearest tenth.



1 in. \approx 2.54 cm

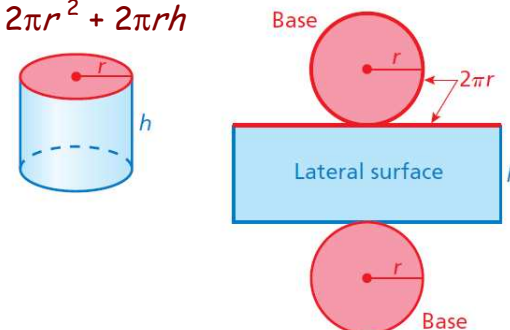


Your next card will look like this!

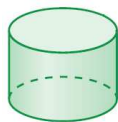
Key Ideas

The surface area of a cylinder is the sum of the areas of the bases and the lateral surface.

Surface Area: $S = 2\pi r^2 + 2\pi rh$



H Solution:



First, convert all units to inches.

$$15.24 \text{ cm} \times \frac{1 \text{ in.}}{2.54 \text{ cm}} \approx 6 \text{ in.}$$

Then, find the surface area.

$$\begin{aligned} S &= 2\pi r^2 + 2\pi rh \\ &= 2\pi(6)^2 + 2\pi(6)(9) \\ &= 72\pi + 108\pi \\ &= 180\pi \\ &\approx 565.5 \text{ in.}^2 \end{aligned}$$

The surface area is about 565.5 square inches.

565.5 in.²

I In a coordinate plane, draw the figures with the given vertices. Which figures are similar? Explain your reasoning.

Triangle A: (0, 0), (9, 0), (0, 9)

Triangle B: (0, 0), (6, 0), (0, 9)

Triangle C: (0, 0), (6, 0), (0, 6)



Congratulations!

Once you have checked the solution with your teacher, your group is all done!

Key Ideas

Figures that have the same shape but not necessarily the same size are called *similar figures*.

Two figures are *similar* if corresponding side lengths are proportional, and corresponding angles have the same measure.



Scavenger Hunt Review Game
Blue Book
Big Ideas Learning

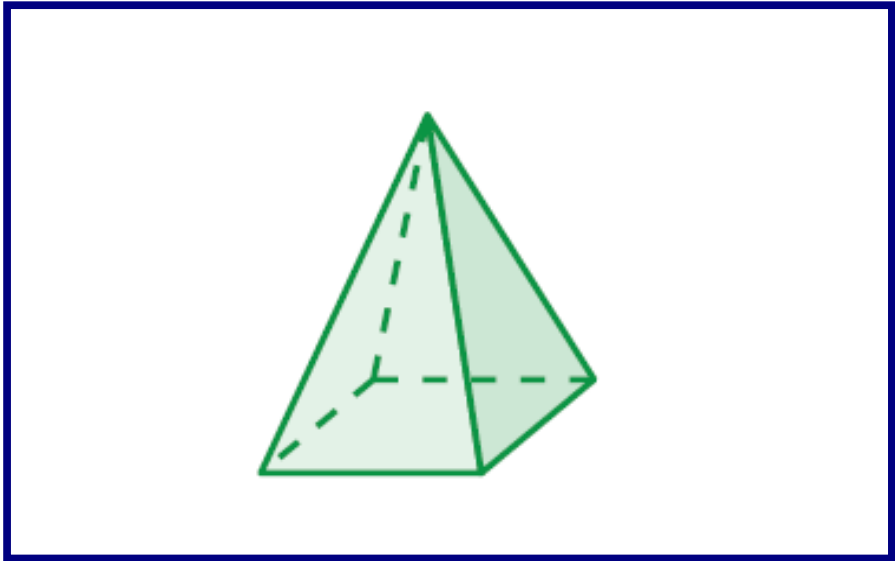
A Solution:

A **rectangular pyramid** is a solid that has one rectangular base and the lateral faces are triangles. So, the solid shown is a rectangular pyramid.



Descartes

Each card for your group should have this solid. If you do not see a rectangular pyramid, go back and try again.

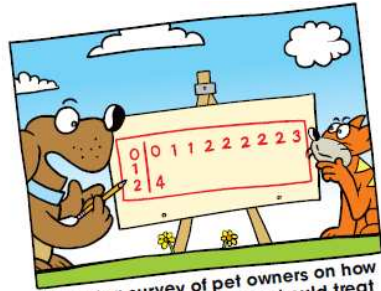


B Make a stem-and-leaf plot of the number of songs downloaded.

Songs Downloaded			
26	14	5	34
45	6	20	34
6	21	19	9



Your next card will look like this!



"I took a survey of pet owners on how many times per day you should treat your dog to a biscuit."

Key Idea
A **stem-and-leaf** plot uses the digits of the data values to organize a data set. Each data value is broken into a stem (digit or digits on the left) and a leaf (digit or digits on the right).

B Solution:



To make a stem-and-leaf plot:

1. Order the data.
2. Choose the stems and the leaves. Because the data values range from 5 to 45, use the *tens* digits for the stems and the *ones* digits for the leaves.
3. Write the *stems* to the left of the vertical line.
4. Write the *leaves* for each stem to the right of the vertical line.

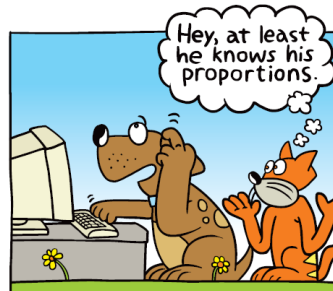
The stem-and-leaf plot is shown on the front with a title and a key.

Songs Downloaded

Stem	Leaves
0	5 6 6 9
1	4 9
2	0 1 6
3	4 4
4	5

Key: 1 | 4 = 14 songs

C It costs \$37.50 for 5 tickets to the movies. Write and solve a proportion to determine how much 3 tickets will cost.



"I got 15 on my online test. That's 105 in dog points! Isn't that an A+?"

Key Ideas

A **proportion** is an equation stating that two ratios are equivalent.

To solve a proportion, use the **Multiplication Property of Equality** or the **Cross Products Property**.



Your next card will look like this!

C Solution:



First, write a proportion.

$$\frac{37.50}{5} = \frac{x}{3}$$

← dollars
← tickets

$$37.50 \cdot 3 = 5 \cdot x$$

Cross Products Property.

$$112.5 = 5x$$

Multiply.

$$22.5 = x$$

Divide.

So, it will cost \$22.50 for 3 tickets to the movies.



D Evaluate the expression

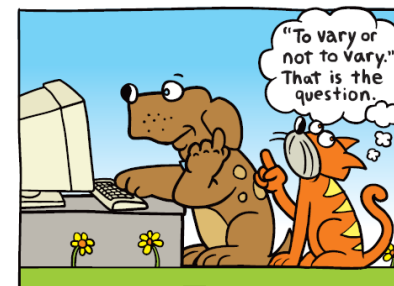
$$x^2 - |y - 2| + \frac{12}{x}$$

when $x = 2$ and $y = -1$.



Your next card will look like this!

Key Idea
Use the *order of operations* when evaluating an expression.



Scavenger Hunt Review Game
Blue Book
Big Ideas Learning

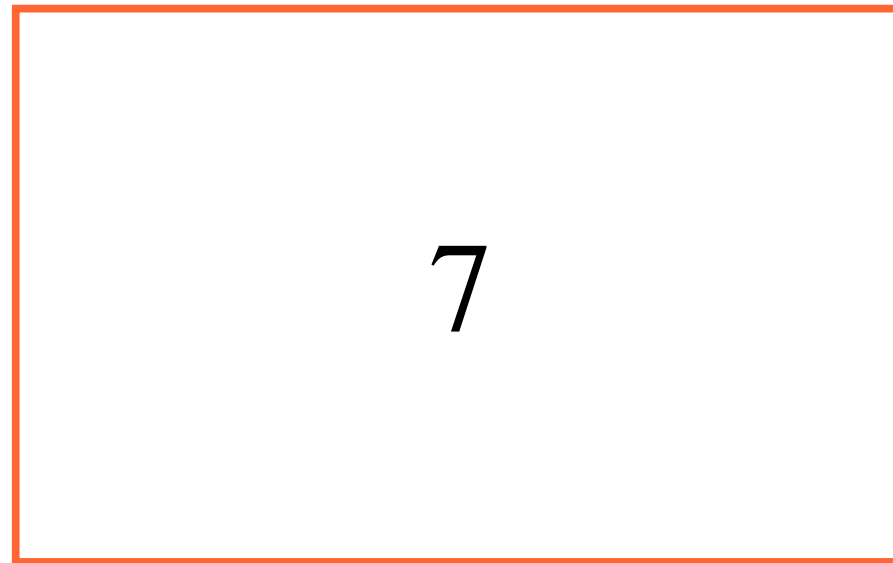
"Dear Sir: Yesterday you said $x = 2$.
Today you are saying $x = 3$.
Please make up your mind."

D Solution:

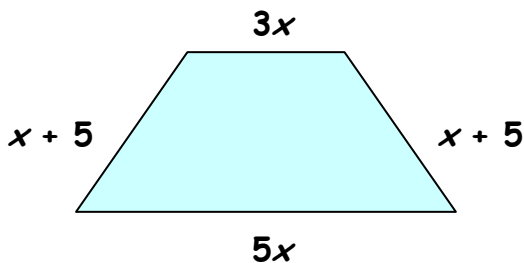


Use substitution for $x = 2$ and $y = -1$.

$$\begin{aligned} & x^2 - |y - 2| + \frac{12}{x} \\ &= (2)^2 - |(-1) - 2| + \frac{12}{2} \\ &= 4 - |-3| + (6) \\ &= 4 - 3 + (6) \\ &= 4 + (-3) + (6) \\ &= 7 \end{aligned}$$



E The perimeter of the trapezoid is 30.
What is the value of x ?



Your next card will look like this!

Key Ideas

The perimeter of a figure is the sum of the sides.

To solve an equation:

- combine like terms
- undo addition and subtraction
- undo multiplication and division

Hint



E Solution:



$P =$ Sum of all sides

$$30 = (x + 5) + 3x + (x + 5) + 5x$$

$$30 = 10x + 10$$

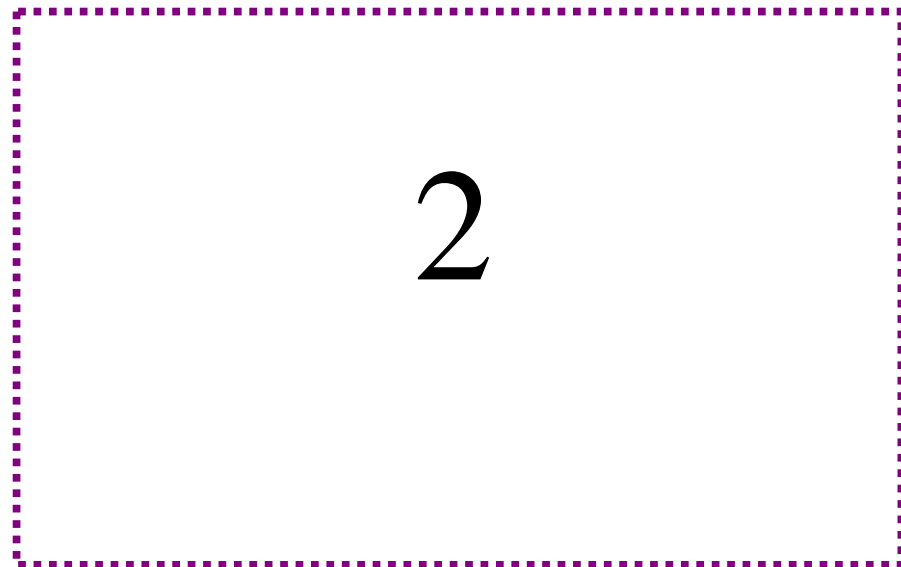
$$\color{red}{-10} \quad \color{red}{-10}$$

$$20 = 10x$$

$$\frac{\color{red}{20}}{\color{red}{10}} = \frac{\color{red}{10x}}{\color{red}{10}}$$

$$2 = x$$

So, the value of x is 2.



F Graph the line that passes through the two points $(-2, 2)$ and $(0, 3)$. Then find the slope of the line.



"I am doing an experiment with slope. I want you to run up and down the board 10 times."



Your next card will look like this!

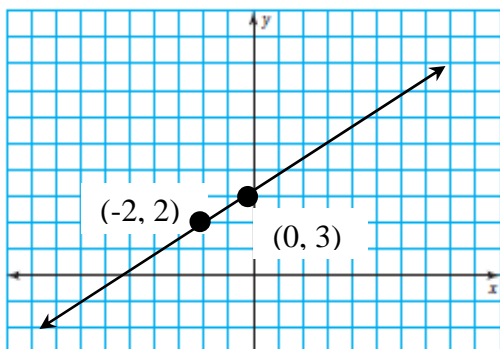
Key Ideas

An **ordered pair** (x, y) is a pair of numbers that is used to locate a point in a coordinate plane.

Slope is the rate of change between any two points on a line.

To find the **slope** of a line, find the ratio of the vertical change to the horizontal change.

F

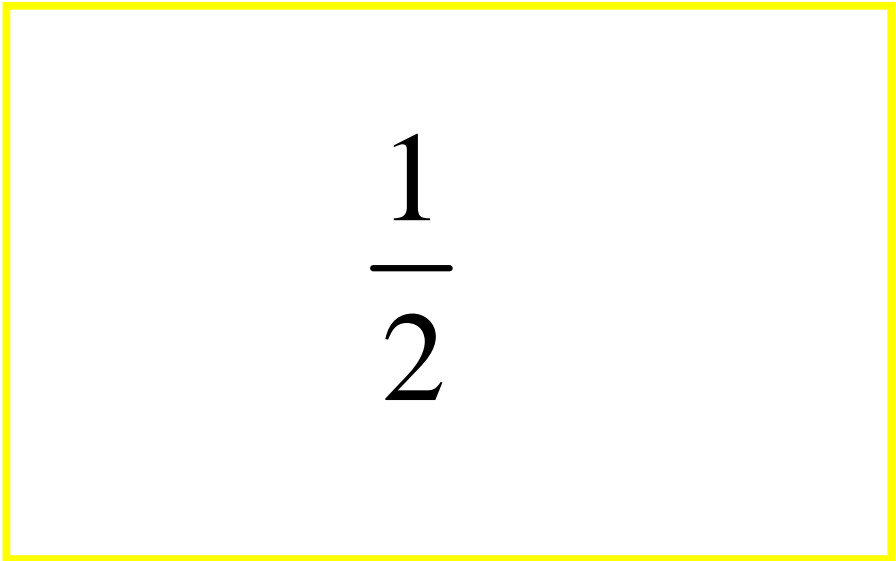


Solution:

The two points are plotted as shown.

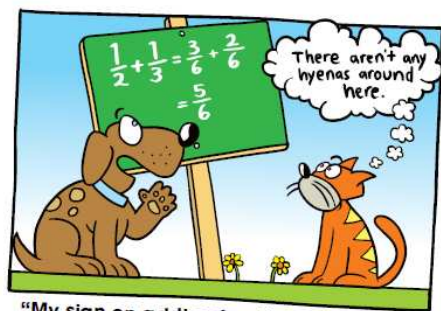
$$\text{Slope: } \frac{\text{change in } y}{\text{change in } x} = \frac{1}{2}$$

So, the slope is $\frac{1}{2}$.



G What is the difference of

$$1\frac{3}{10} \text{ and } -2\frac{4}{5}?$$



"My sign on adding fractions with unlike denominators is keeping the hyenas away."



Your next card will look like this!

Key Ideas

To subtract a rational number, add its *opposite*.

To add rational numbers, rewrite each number using the **LCD** (least common denominator), add the numerators and simplify.



G Solution:



$$1\frac{3}{10} - \left(-2\frac{4}{5}\right)$$

$$= 1\frac{3}{10} + 2\frac{4}{5}$$

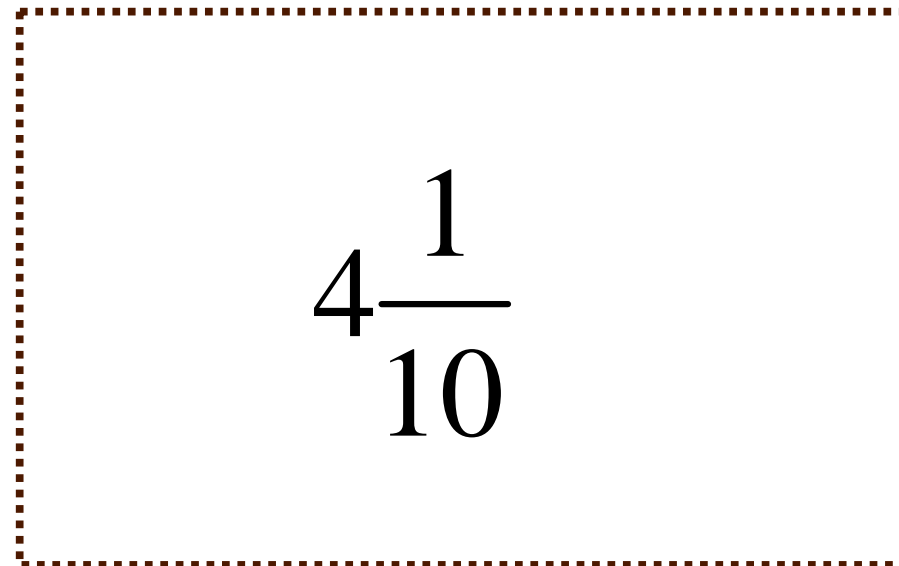
$$= \frac{13}{10} + \frac{14}{5}$$

$$= \frac{13}{10} + \frac{28}{10}$$

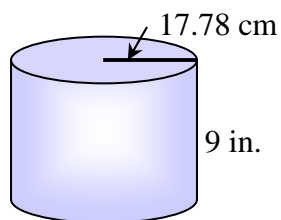
$$= \frac{41}{10}$$

$$= 4\frac{1}{10}$$

So, the difference is $4\frac{1}{10}$.



H Find the surface area of the cylinder in square inches. Round your answer to the nearest tenth.



$$1 \text{ in.} \approx 2.54 \text{ cm}$$

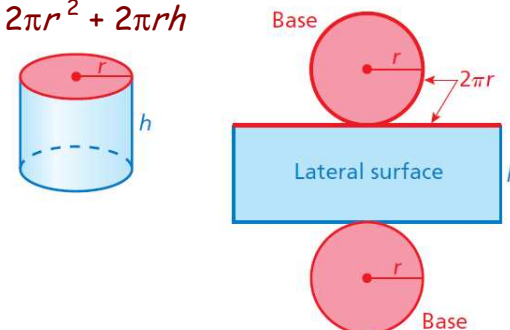


Your next card will look like this!

Key Ideas

The surface area of a cylinder is the sum of the areas of the bases and the lateral surface.

$$\text{Surface Area: } S = 2\pi r^2 + 2\pi rh$$



H Solution:



First, convert all units to inches.

$$17.78 \text{ cm} \times \frac{1 \text{ in.}}{2.54 \text{ cm}} \approx 7 \text{ in.}$$

Then, find the surface area.

$$\begin{aligned} S &= 2\pi r^2 + 2\pi rh \\ &= 2\pi(7)^2 + 2\pi(7)(9) \\ &= 98\pi + 126\pi \\ &= 224\pi \\ &\approx 703.7 \text{ in.}^2 \end{aligned}$$

The surface area is about 703.7 square inches.

703.7 in.²

I In a coordinate plane, draw the figures with the given vertices. Which figures are similar? Explain your reasoning.

Triangle A: (0, 0), (9, 0), (0, 9)

Triangle B: (0, 0), (6, 0), (0, 9)

Triangle C: (0, 0), (6, 0), (0, 6)



Congratulations!

Once you have checked the solution with your teacher, your group is all done!

Key Ideas

Figures that have the same shape but not necessarily the same size are called *similar figures*.

Two figures are *similar* if corresponding side lengths are proportional, and corresponding angles have the same measure.



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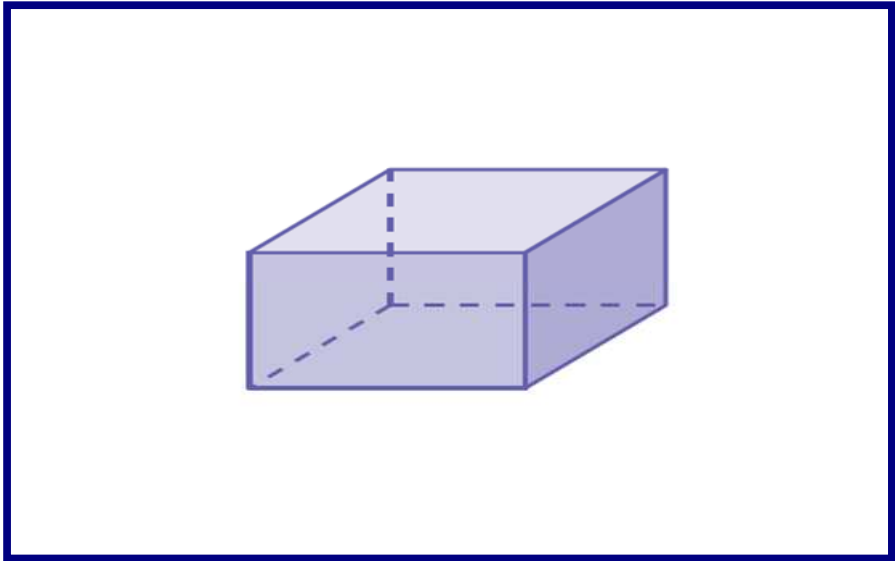
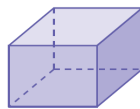
A Solution:

A *rectangular prism* is a solid that has two parallel, identical rectangular bases. So, the solid shown is a rectangular prism.



Descartes

Each card for your group should have this solid. If you do not see a rectangular prism, go back and try again.

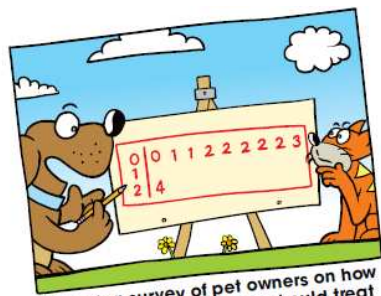


B Make a stem-and-leaf plot of the number of songs downloaded.

Songs Downloaded			
7	14	5	34
45	27	20	22
39	13	45	9

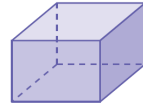


Your next card will look like this!



Key Idea
A **stem-and-leaf** plot uses the digits of the data values to organize a data set. Each data value is broken into a stem (digit or digits on the left) and a leaf (digit or digits on the right).

B Solution:



To make a stem-and-leaf plot:

1. Order the data.
2. Choose the stems and the leaves. Because the data values range from 5 to 45, use the *tens* digits for the stems and the *ones* digits for the leaves.
3. Write the *stems* to the left of the vertical line.
4. Write the *leaves* for each stem to the right of the vertical line.

The stem-and-leaf plot is shown on the front with a title and a key.

Songs Downloaded

Stem	Leaves
0	5 7 9
1	3 4
2	0 2 7
3	4 9
4	5 5

Key: 1 | 4 = 14 songs

C It costs \$37.50 for 5 tickets to the movies. Write and solve a proportion to determine how much 9 tickets will cost.



"I got 15 on my online test. That's 105 in dog points! Isn't that an A+?"



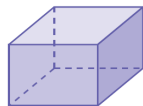
Your next card will look like this!

Key Ideas

A **proportion** is an equation stating that two ratios are equivalent.

To solve a proportion, use the **Multiplication Property of Equality** or the **Cross Products Property**.

C Solution:



First, write a proportion.

$$\frac{37.50}{5} = \frac{x}{9}$$

← dollars
← tickets

$$37.50 \cdot 9 = 5 \cdot x$$

Cross Products Property.

$$337.5 = 5x$$

Multiply.

$$67.5 = x$$

Divide.

So, it will cost \$67.50 for 9 tickets to the movies.



D Evaluate the expression

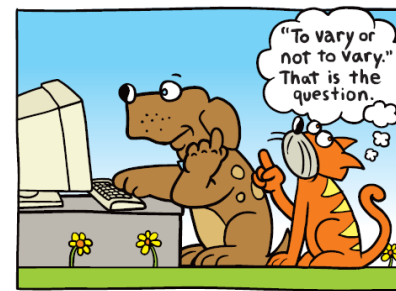
$$x^2 - |y - 2| + \frac{12}{x}$$

when $x = 3$ and $y = -1$.



Your next card will look like this!

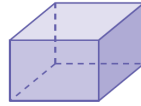
Key Idea
Use the *order of operations* when evaluating an expression.



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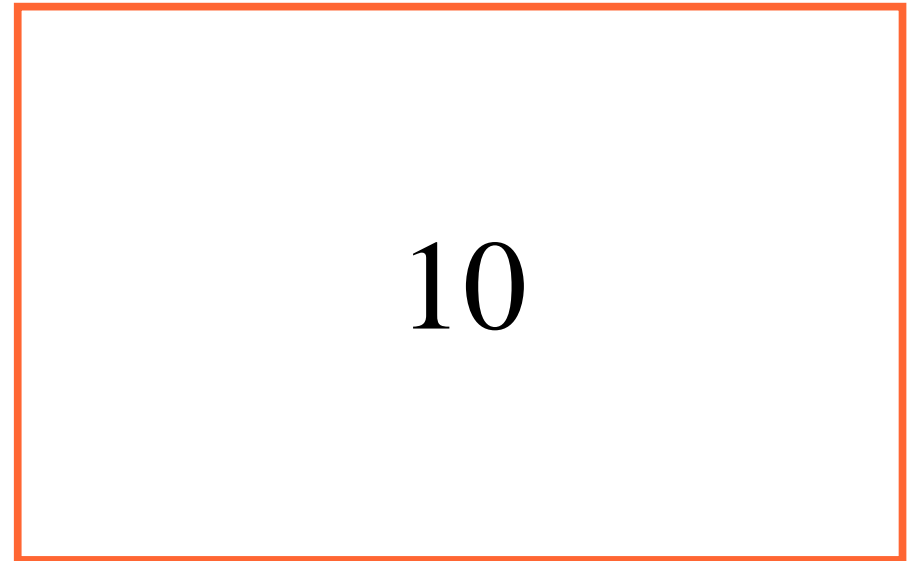
"Dear Sir: Yesterday you said $x = 2$.
Today you are saying $x = 3$.
Please make up your mind."

D Solution:

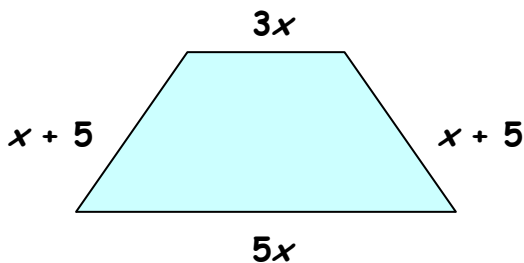


Use substitution for $x = 3$ and $y = -1$.

$$\begin{aligned} & x^2 - |y - 2| + \frac{12}{x} \\ &= (3)^2 - |(-1) - 2| + \frac{12}{3} \\ &= 9 - |-3| + (4) \\ &= 9 - 3 + 4 \\ &= 9 + (-3) + 4 \\ &= 10 \end{aligned}$$



E The perimeter of the trapezoid is 60.
What is the value of x ?



Your next card will look like this!

Key Ideas

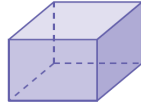
The perimeter of a figure is the sum of the sides.

To solve an equation:

- combine like terms
- undo addition and subtraction
- undo multiplication and division



E Solution:



$P =$ Sum of all sides

$$60 = (x + 5) + 3x + (x + 5) + 5x$$

$$60 = 10x + 10$$

$$\color{red}{-10} \quad \color{red}{-10}$$

$$50 = 10x$$

$$\frac{50}{\color{red}{10}} = \frac{10x}{\color{red}{10}}$$

$$5 = x$$

So, the value of x is 5.



F Graph the line that passes through the two points $(-2, 2)$ and $(1, 2)$. Then find the slope of the line.



"I am doing an experiment with slope. I want you to run up and down the board 10 times."



Your next card will look like this!

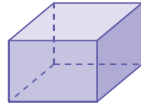
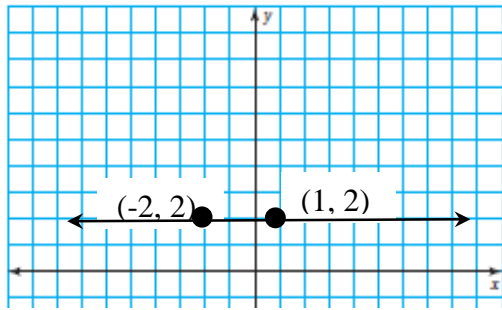
Key Ideas

An **ordered pair** (x, y) is a pair of numbers that is used to locate a point in a coordinate plane.

Slope is the rate of change between any two points on a line.

To find the **slope** of a line, find the ratio of the vertical change to the horizontal change.

F

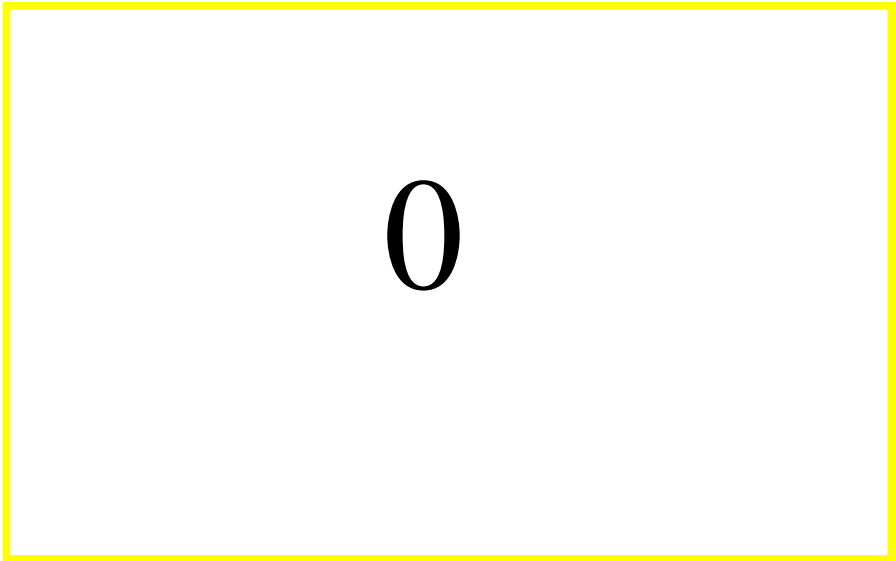


Solution:

The two points are plotted as shown.

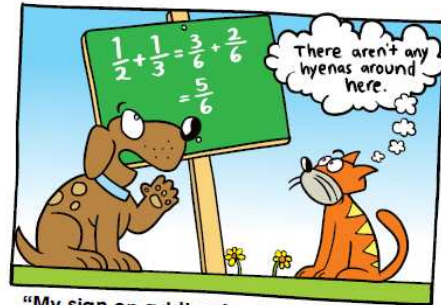
$$\text{Slope: } \frac{\text{change in } y}{\text{change in } x} = \frac{0}{3} = 0$$

So, the slope is 0.



G What is the difference of

$$1\frac{4}{5} \text{ and } 3\frac{3}{10}?$$



"My sign on adding fractions with unlike denominators is keeping the hyenas away."



Your next card will look like this!

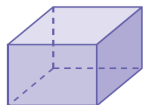
Key Ideas

To subtract a rational number, add its *opposite*.

To add rational numbers, rewrite each number using the **LCD** (least common denominator), add the numerators and simplify.



G Solution:



$$1\frac{4}{5} - 3\frac{3}{10}$$

$$= 1\frac{4}{5} + \left(-3\frac{3}{10}\right)$$

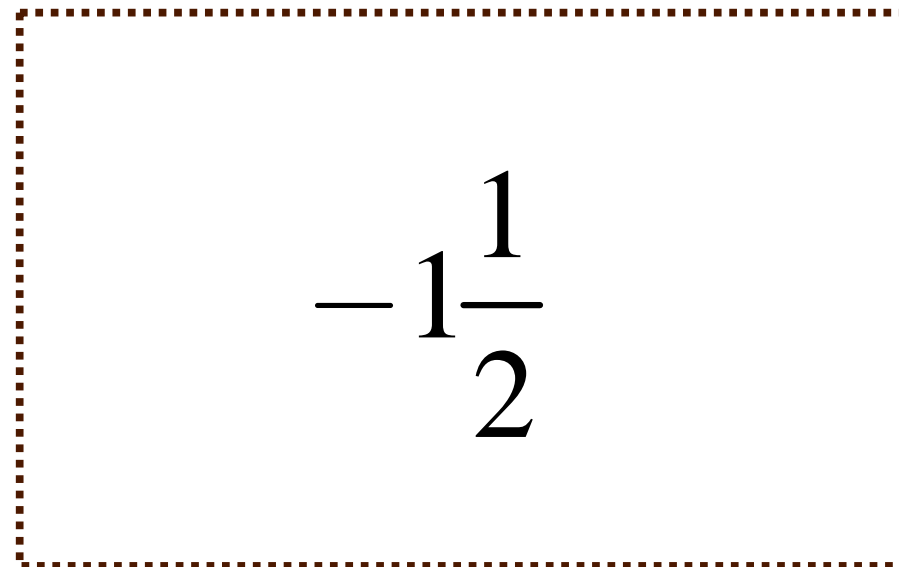
$$= \frac{9}{5} + \left(-\frac{33}{10}\right)$$

$$= \frac{18}{10} + \left(-\frac{33}{10}\right)$$

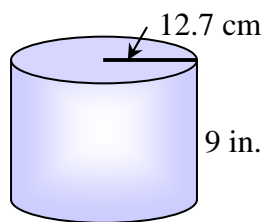
$$= \frac{-15}{10}$$

$$= -1\frac{1}{2}$$

So, the difference is $-1\frac{1}{2}$.



H Find the surface area of the cylinder in square inches. Round your answer to the nearest tenth.



$$1 \text{ in.} \approx 2.54 \text{ cm}$$

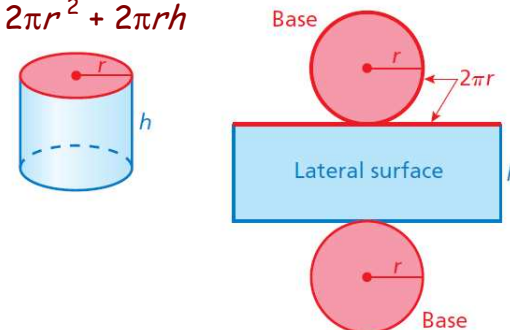


Your next card will look like this!

Key Ideas

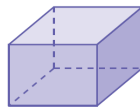
The surface area of a cylinder is the sum of the areas of the bases and the lateral surface.

$$\text{Surface Area: } S = 2\pi r^2 + 2\pi rh$$



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H Solution:



First, convert all units to inches.

$$12.7 \text{ cm} \times \frac{1 \text{ in.}}{2.54 \text{ cm}} \approx 5 \text{ in.}$$

Then, find the surface area.

$$\begin{aligned} S &= 2\pi r^2 + 2\pi rh \\ &= 2\pi(5)^2 + 2\pi(5)(9) \\ &= 50\pi + 90\pi \\ &= 140\pi \\ &\approx 439.8 \text{ in.}^2 \end{aligned}$$

The surface area is about 439.8 square inches.

439.8 in.²

I In a coordinate plane, draw the figures with the given vertices. Which figures are similar? Explain your reasoning.

Triangle A: (0, 0), (9, 0), (0, 9)

Triangle B: (0, 0), (6, 0), (0, 9)

Triangle C: (0, 0), (6, 0), (0, 6)



Congratulations!

Once you have checked the solution with your teacher, your group is all done!

Key Ideas

Figures that have the same shape but not necessarily the same size are called *similar figures*.

Two figures are *similar* if corresponding side lengths are proportional, and corresponding angles have the same measure.



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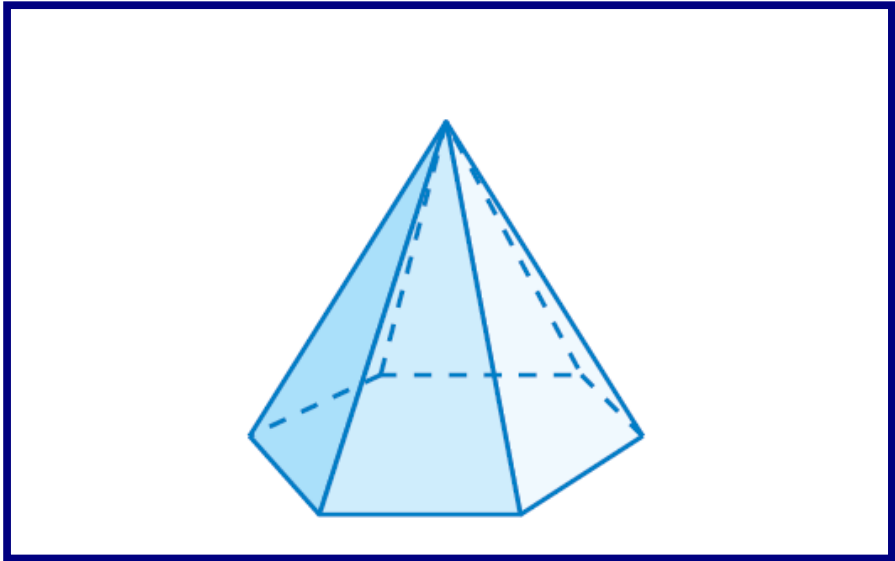
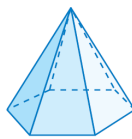
A Solution:

A *hexagonal pyramid* is a solid that has one hexagonal base and the lateral faces are triangles. So, the solid shown is a hexagonal pyramid.



Descartes

Each card for your group should have this solid. If you do not see a hexagonal pyramid, go back and try again.

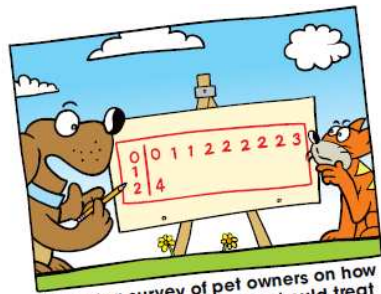


B Make a stem-and-leaf plot of the number of songs downloaded.

Songs Downloaded			
36	14	5	34
45	27	20	41
34	16	34	9



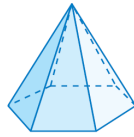
Your next card will look like this!



"I took a survey of pet owners on how many times per day you should treat your dog to a biscuit."

Key Idea
A **stem-and-leaf** plot uses the digits of the data values to organize a data set. Each data value is broken into a stem (digit or digits on the left) and a leaf (digit or digits on the right).

B Solution:



To make a stem-and-leaf plot:

1. Order the data.
2. Choose the stems and the leaves. Because the data values range from 5 to 45, use the *tens* digits for the stems and the *ones* digits for the leaves.
3. Write the *stems* to the left of the vertical line.
4. Write the *leaves* for each stem to the right of the vertical line.

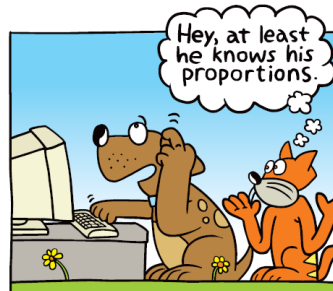
The stem-and-leaf plot is shown on the front with a title and a key.

Songs Downloaded

Stem	Leaves
0	5 9
1	4 6
2	0 7
3	4 4 4 6
4	1 5

Key: 1 | 4 = 14 songs

C It costs \$37.50 for 5 tickets to the movies. Write and solve a proportion to determine how much 6 tickets will cost.



"I got 15 on my online test. That's 105 in dog points! Isn't that an A+?"

Key Ideas

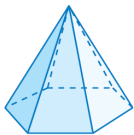
A **proportion** is an equation stating that two ratios are equivalent.

To solve a proportion, use the **Multiplication Property of Equality** or the **Cross Products Property**.



Your next card will look like this!

C Solution:



First, write a proportion.

$$\frac{37.50}{5} = \frac{x}{6}$$

← dollars
← tickets

$$37.50 \cdot 6 = 5 \cdot x \quad \text{Cross Products Property.}$$
$$225 = 5x \quad \text{Multiply.}$$
$$45 = x \quad \text{Divide.}$$

So, it will cost \$45 for 6 tickets to the movies.



D Evaluate the expression

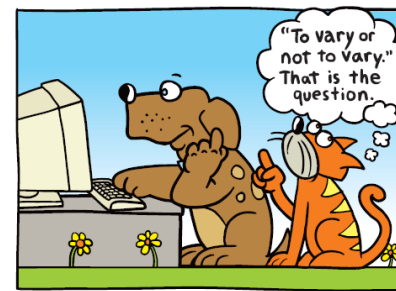
$$x^2 - |y - 2| + \frac{12}{x}$$

when $x = -2$ and $y = 1$.



Your next card will look like this!

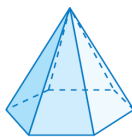
Key Idea
Use the *order of operations* when evaluating an expression.



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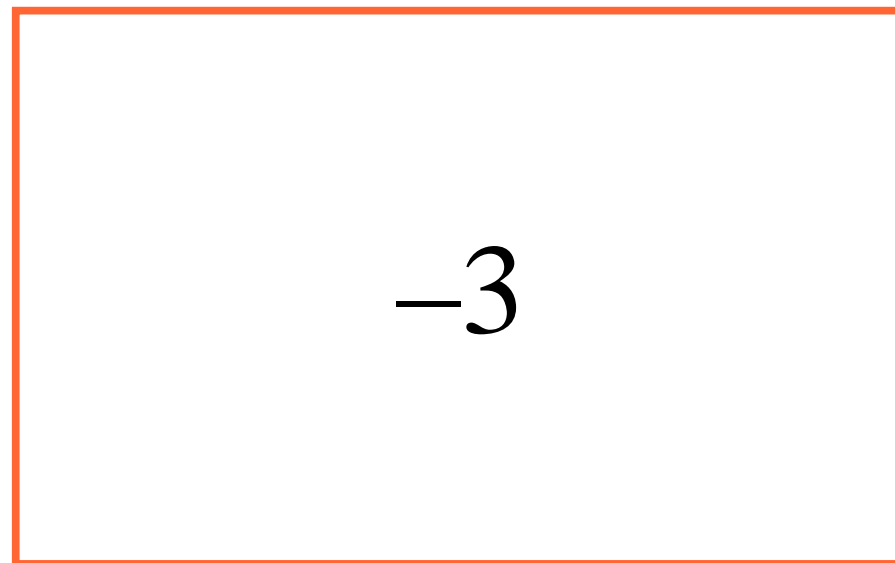
"Dear Sir: Yesterday you said $x = 2$.
Today you are saying $x = 3$.
Please make up your mind."

D Solution:

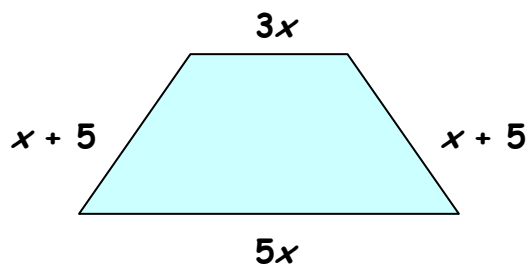


Use substitution for $x = -2$ and $y = 1$.

$$\begin{aligned} & x^2 - |y - 2| + \frac{12}{x} \\ &= (-2)^2 - |(1) - 2| + \frac{12}{-2} \\ &= 4 - |-1| + (-6) \\ &= 4 - 1 + (-6) \\ &= 4 + (-1) + (-6) \\ &= -3 \end{aligned}$$



E The perimeter of the trapezoid is 100.
What is the value of x ?



Your next card will look like this!

Key Ideas

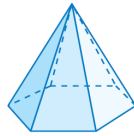
The perimeter of a figure is the sum of the sides.

To solve an equation:

- combine like terms
- undo addition and subtraction
- undo multiplication and division



E Solution:



$P =$ Sum of all sides

$$100 = (x + 5) + 3x + (x + 5) + 5x$$

$$100 = 10x + 10$$

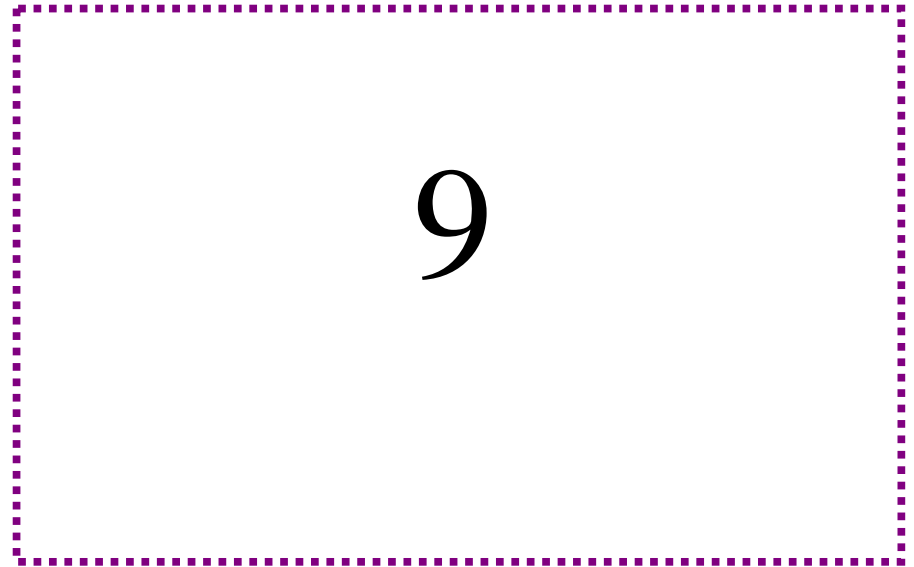
$$\color{red}{-10} \quad \color{red}{-10}$$

$$90 = 10x$$

$$\frac{\color{red}{90}}{\color{red}{10}} = \frac{\color{red}{10x}}{\color{red}{10}}$$

$$9 = x$$

So, the value of x is 9.



F Graph the line that passes through the two points $(-2, 2)$ and $(3, 0)$. Then find the slope of the line.



"I am doing an experiment with slope. I want you to run up and down the board 10 times."



Your next card will look like this!

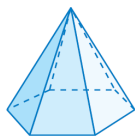
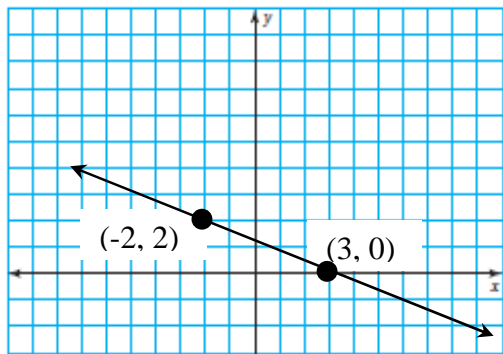
Key Ideas

An **ordered pair** (x, y) is a pair of numbers that is used to locate a point in a coordinate plane.

Slope is the rate of change between any two points on a line.

To find the **slope** of a line, find the ratio of the vertical change to the horizontal change.

F



Solution:

The two points are plotted as shown.

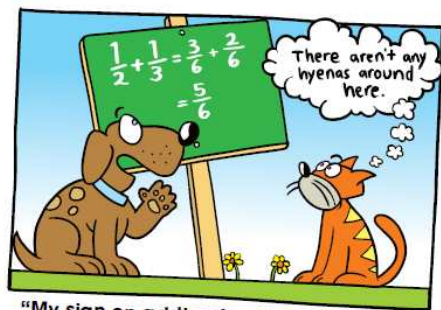
$$\text{Slope: } \frac{\text{change in } y}{\text{change in } x} = \frac{-2}{5}$$

So, the slope is $-\frac{2}{5}$.

$$-\frac{2}{5}$$

G What is the difference of

$$-1\frac{3}{10} \text{ and } 2\frac{4}{5}?$$



"My sign on adding fractions with unlike denominators is keeping the hyenas away."



Your next card will look like this!

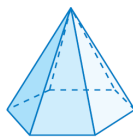
Key Ideas

To subtract a rational number, add its *opposite*.

To add rational numbers, rewrite each number using the **LCD** (least common denominator), add the numerators and simplify.

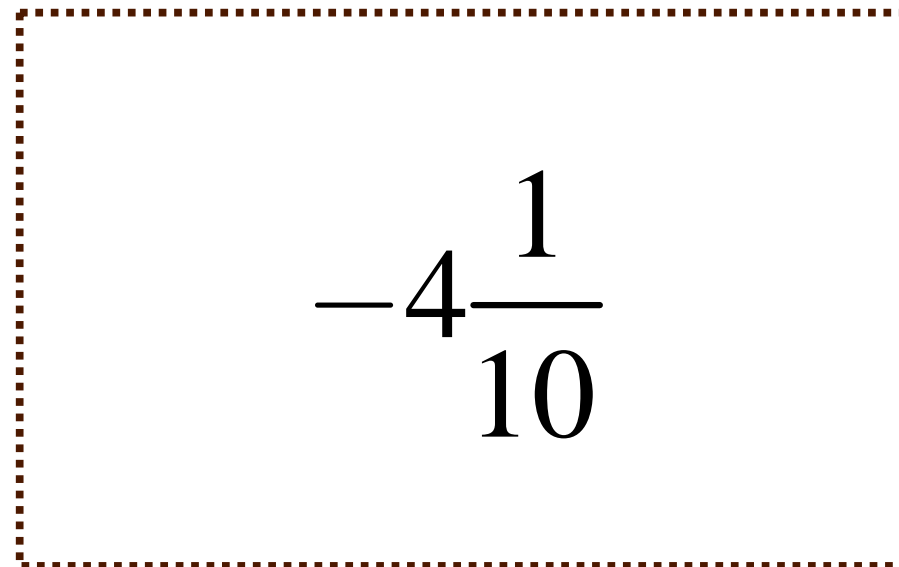


G Solution:

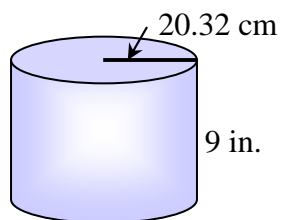


$$\begin{aligned} & -1\frac{3}{10} - 2\frac{4}{5} \\ &= -1\frac{3}{10} + \left(-2\frac{4}{5}\right) \\ &= \frac{-13}{10} + \frac{-14}{5} \\ &= \frac{-13}{10} + \frac{-28}{10} \\ &= \frac{-41}{10} \\ &= -4\frac{1}{10} \end{aligned}$$

So, the difference is $-4\frac{1}{10}$.



H Find the surface area of the cylinder in square inches. Round your answer to the nearest tenth.



1 in. \approx 2.54 cm

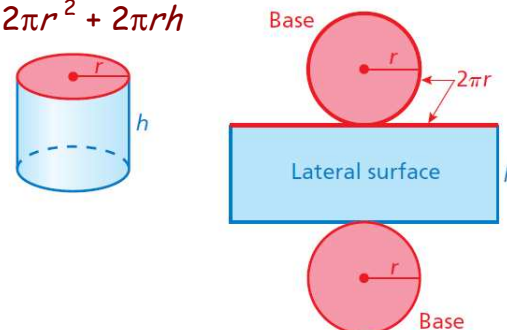


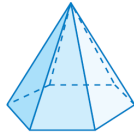
Your next card will look like this!

Key Ideas

The surface area of a cylinder is the sum of the areas of the bases and the lateral surface.

Surface Area: $S = 2\pi r^2 + 2\pi rh$



H**Solution:**

First, convert all units to inches.

$$20.32 \text{ cm} \times \frac{1 \text{ in.}}{2.54 \text{ cm}} \approx 8 \text{ in.}$$

Then, find the surface area.

$$\begin{aligned} S &= 2\pi r^2 + 2\pi rh \\ &= 2\pi(8)^2 + 2\pi(8)(9) \\ &= 128\pi + 144\pi \\ &= 272\pi \\ &\approx 854.5 \text{ in.}^2 \end{aligned}$$

The surface area is about 854.5 square inches.

854.5 in.²

I

In a coordinate plane, draw the figures with the given vertices. Which figures are similar? Explain your reasoning.

Triangle A: (0, 0), (9, 0), (0, 9)

Triangle B: (0, 0), (6, 0), (0, 9)

Triangle C: (0, 0), (6, 0), (0, 6)



Congratulations!

Once you have checked the solution with your teacher, your group is all done!

Key Ideas

Figures that have the same shape but not necessarily the same size are called *similar figures*.

Two figures are *similar* if corresponding side lengths are proportional, and corresponding angles have the same measure.



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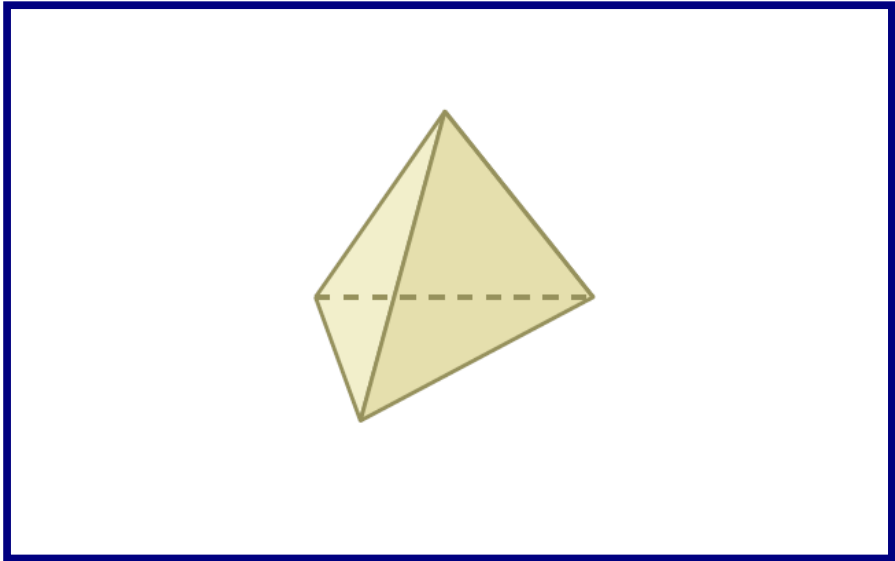
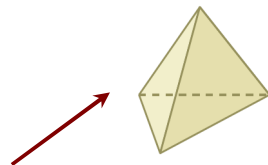
A Solution:

A **triangular pyramid** is a solid that has one triangular base and triangular lateral faces. So, the solid shown is a triangular pyramid.



Descartes

Each card for your group should have this solid. If you do not see a triangular pyramid, go back and try again.

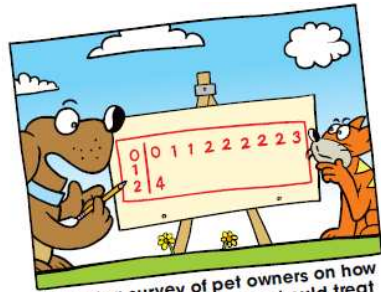


B Make a stem-and-leaf plot of the number of songs downloaded.

Songs Downloaded			
9	14	5	63
45	49	20	17
60	24	31	9



Your next card will look like this!

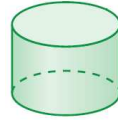


"I took a survey of pet owners on how many times per day you should treat your dog to a biscuit."

Key Idea

A **stem-and-leaf** plot uses the digits of the data values to organize a data set. Each data value is broken into a stem (digit or digits on the left) and a leaf (digit or digits on the right).

B Solution:



To make a stem-and-leaf plot:

1. Order the data.
2. Choose the stems and the leaves. Because the data values range from 5 to 63, use the *tens* digits for the stems and the *ones* digits for the leaves.
3. Write the *stems* to the left of the vertical line.
4. Write the *leaves* for each stem to the right of the vertical line.

The stem-and-leaf plot is shown on the front with a title and a key.

Songs Downloaded

Stem	Leaves
0	5 9 9
1	4 7
2	0 4
3	1
4	5 9
5	
6	0 3

Key: 1 | 4 = 14 songs

C It costs \$41.25 for 5 tickets to the movies. Write and solve a proportion to determine how much 8 tickets will cost.



"I got 15 on my online test. That's 105 in dog points! Isn't that an A+?"



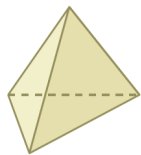
Your next card will look like this!

Key Ideas

A **proportion** is an equation stating that two ratios are equivalent.

To solve a proportion, use the **Multiplication Property of Equality** or the **Cross Products Property**.

C Solution:



First, write a proportion.

$$\frac{41.25}{5} = \frac{x}{8}$$

← dollars
← tickets

$$41.25 \cdot 8 = 5 \cdot x \quad \text{Cross Products Property.}$$
$$330 = 5x \quad \text{Multiply.}$$
$$66 = x \quad \text{Divide.}$$

So, it will cost \$66 for 8 tickets to the movies.



D Evaluate the expression

$$x^2 - |y - 2| + \frac{12}{x}$$

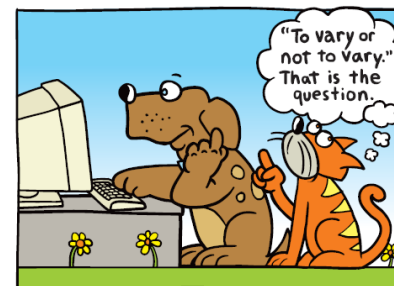
when $x = 1$ and $y = -3$.



Your next card will look like this!

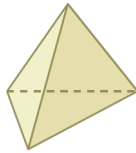
Key Idea

Use the *order of operations* when evaluating an expression.



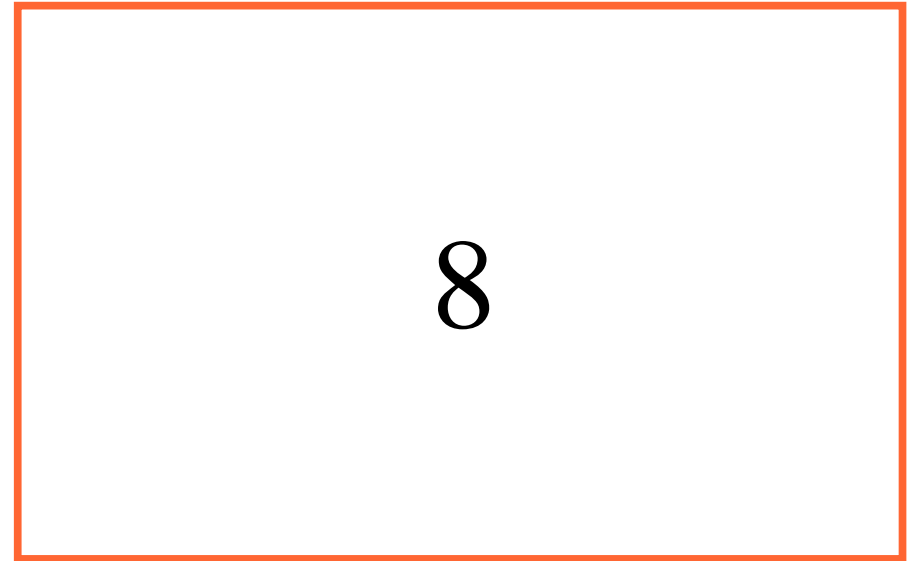
"Dear Sir: Yesterday you said $x = 2$. Today you are saying $x = 3$. Please make up your mind."

D Solution:

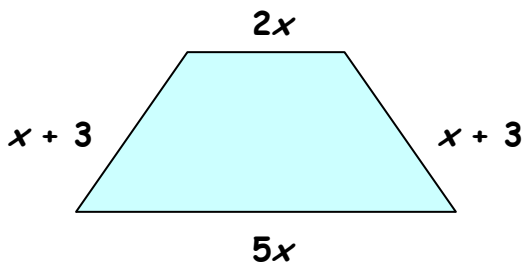


Use substitution for $x = 1$ and $y = -3$.

$$\begin{aligned} & x^2 - |y - 2| + \frac{12}{x} \\ &= (1)^2 - |(-3) - 2| + \frac{12}{1} \\ &= 1 - |-5| + (12) \\ &= 1 - 5 + (12) \\ &= 1 + (-5) + (12) \\ &= 8 \end{aligned}$$



E The perimeter of the trapezoid is 42.
What is the value of x ?



Your next card will look like this!

Key Ideas

The perimeter of a figure is the sum of the sides.

To solve an equation:

- combine like terms
- undo addition and subtraction
- undo multiplication and division

Hint



E Solution:

$P =$ Sum of all sides

$$42 = (x + 3) + 2x + (x + 3) + 5x$$

$$42 = 9x + 6$$

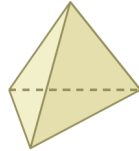
$$\begin{array}{r} -6 \\ -6 \end{array}$$

$$36 = 9x$$

$$\frac{36}{9} = \frac{9x}{9}$$

$$4 = x$$

So, the value of x is 4.



4

F Graph the line that passes through the two points $(-2, 2)$ and $(1, -1)$. Then find the slope of the line.



"I am doing an experiment with slope. I want you to run up and down the board 10 times."



Your next card will look like this!

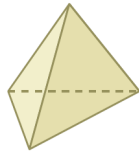
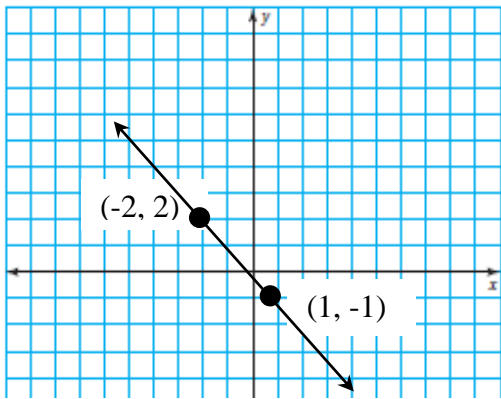
Key Ideas

An **ordered pair** (x, y) is a pair of numbers that is used to locate a point in a coordinate plane.

Slope is the rate of change between any two points on a line.

To find the **slope** of a line, find the ratio of the vertical change to the horizontal change.

F

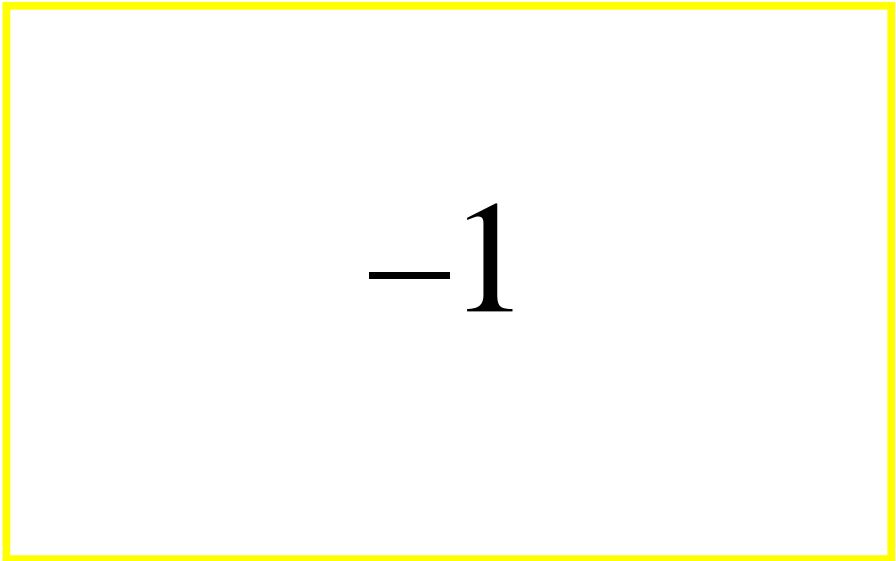


Solution:

The two points are plotted as shown.

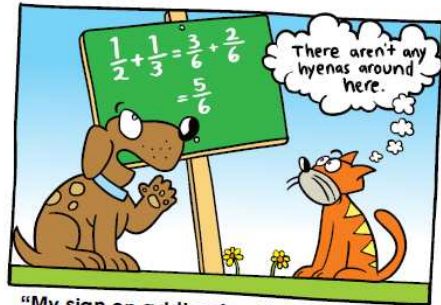
$$\text{Slope: } \frac{\text{change in } y}{\text{change in } x} = \frac{-3}{3} = -1$$

So, the slope is -1 .



G What is the difference of

$$-1\frac{4}{5} \text{ and } -3\frac{3}{10}?$$



"My sign on adding fractions with unlike denominators is keeping the hyenas away."



Your next card will look like this!

Key Ideas

To subtract a rational number, add its *opposite*.

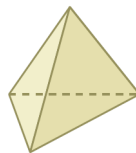
To add rational numbers, rewrite each number using the **LCD** (least common denominator), add the numerators and simplify.



G Solution:

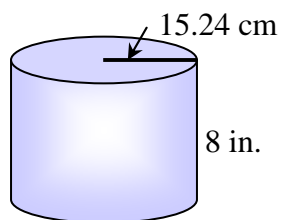
$$\begin{aligned} & -1\frac{4}{5} - \left(-3\frac{3}{10}\right) \\ &= -1\frac{4}{5} + 3\frac{3}{10} \\ &= \frac{-9}{5} + \frac{33}{10} \\ &= \frac{-18}{10} + \frac{33}{10} \\ &= \frac{15}{10} \\ &= 1\frac{1}{2} \end{aligned}$$

So, the difference is $1\frac{1}{2}$.



$1\frac{1}{2}$

H Find the surface area of the cylinder in square inches. Round your answer to the nearest tenth.



1 in. \approx 2.54 cm

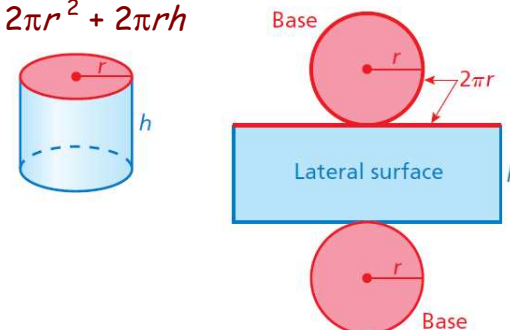


Your next card will look like this!

Key Ideas

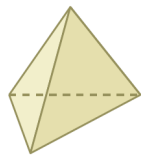
The surface area of a cylinder is the sum of the areas of the bases and the lateral surface.

Surface Area: $S = 2\pi r^2 + 2\pi rh$



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H Solution:



First, convert all units to inches.

$$15.24 \text{ cm} \times \frac{1 \text{ in.}}{2.54 \text{ cm}} \approx 6 \text{ in.}$$

Then, find the surface area.

$$\begin{aligned} S &= 2\pi r^2 + 2\pi rh \\ &= 2\pi(6)^2 + 2\pi(6)(8) \\ &= 72\pi + 96\pi \\ &= 168\pi \\ &\approx 527.8 \text{ in.}^2 \end{aligned}$$

The surface area is about 527.8 square inches.

527.8 in.²

I In a coordinate plane, draw the figures with the given vertices. Which figures are similar? Explain your reasoning.

Triangle A: (0, 0), (9, 0), (0, 9)

Triangle B: (0, 0), (6, 0), (0, 9)

Triangle C: (0, 0), (6, 0), (0, 6)



Congratulations!

Once you have checked the solution with your teacher, your group is all done!

Key Ideas

Figures that have the same shape but not necessarily the same size are called *similar figures*.

Two figures are *similar* if corresponding side lengths are proportional, and corresponding angles have the same measure.



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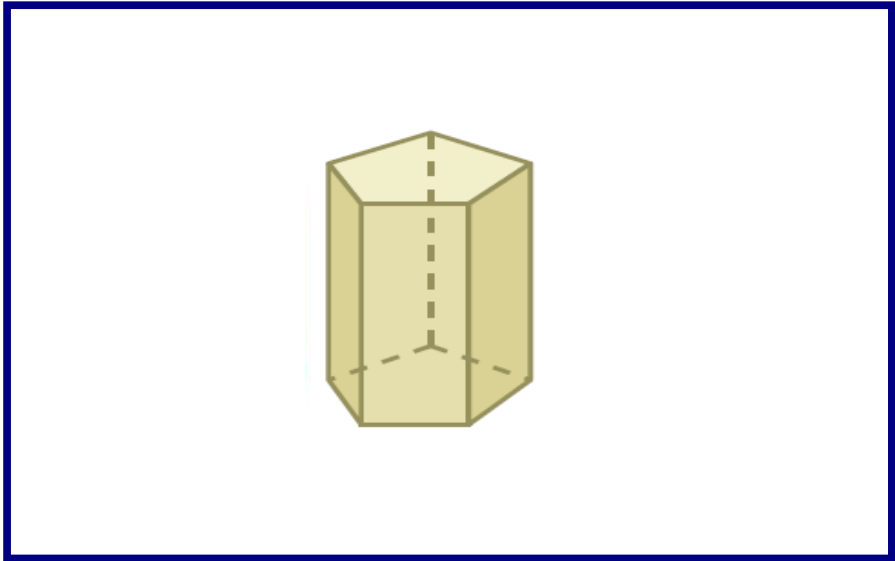
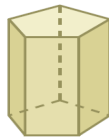
A Solution:

A *pentagonal prism* is a solid that has two parallel pentagonal bases. So, the solid shown is a pentagonal prism.



Descartes

Each card for your group should have this solid. If you do not see a pentagonal prism, go back and try again.

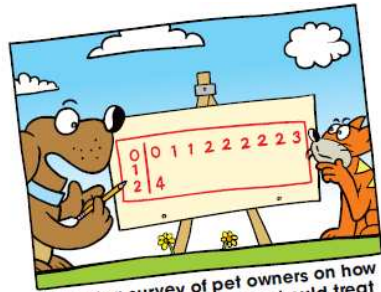


B Make a stem-and-leaf plot of the number of songs downloaded.

Songs Downloaded			
8	14	5	63
45	31	20	48
35	17	31	9



Your next card will look like this!



"I took a survey of pet owners on how many times per day you should treat your dog to a biscuit."

Key Idea

A **stem-and-leaf** plot uses the digits of the data values to organize a data set. Each data value is broken into a stem (digit or digits on the left) and a leaf (digit or digits on the right).

B Solution:



To make a stem-and-leaf plot:

1. Order the data.
2. Choose the stems and the leaves. Because the data values range from 5 to 63, use the *tens* digits for the stems and the *ones* digits for the leaves.
3. Write the *stems* to the left of the vertical line.
4. Write the *leaves* for each stem to the right of the vertical line.

The stem-and-leaf plot is shown on the front with a title and a key.

Songs Downloaded

Stem	Leaves
0	5 8 9
1	4 7
2	0
3	1 1 5
4	5 8
5	
6	3

Key: 1 | 4 = 14 songs

C It costs \$41.25 for 5 tickets to the movies. Write and solve a proportion to determine how much 3 tickets will cost.



"I got 15 on my online test. That's 105 in dog points! Isn't that an A+?"

Key Ideas

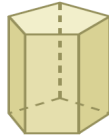
A **proportion** is an equation stating that two ratios are equivalent.

To solve a proportion, use the **Multiplication Property of Equality** or the **Cross Products Property**.



Your next card will look like this!

C Solution:



First, write a proportion.

$$\frac{41.25}{5} = \frac{x}{3}$$

← dollars
← tickets

$$41.25 \cdot 3 = 5 \cdot x \quad \text{Cross Products Property.}$$
$$123.75 = 5x \quad \text{Multiply.}$$
$$24.75 = x \quad \text{Divide.}$$

So, it will cost \$24.75 for 3 tickets to the movies.



D Evaluate the expression

$$x^2 - |y - 2| + \frac{12}{x}$$

when $x = -1$ and $y = 2$.



Your next card will look like this!

Key Idea

Use the *order of operations* when evaluating an expression.

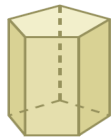


"Dear Sir: Yesterday you said $x = 2$. Today you are saying $x = 3$. Please make up your mind."

D Solution:

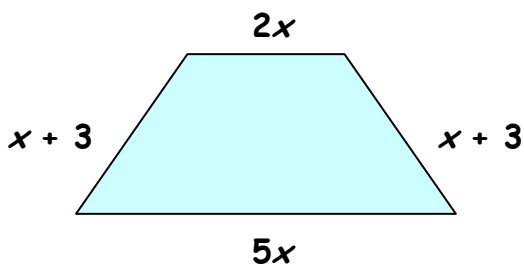
Use substitution for $x = -1$ and $y = 2$.

$$\begin{aligned} & x^2 - |y - 2| + \frac{12}{x} \\ &= (-1)^2 - |(2) - 2| + \frac{12}{-1} \\ &= 1 - |0| + (-12) \\ &= 1 - 0 + (-12) \\ &= 1 + (-12) \\ &= -11 \end{aligned}$$



-11

E The perimeter of the trapezoid is 78.
What is the value of x ?



Your next card will look like this!

Key Ideas

The perimeter of a figure is the sum of the sides.

To solve an equation:

- combine like terms
- undo addition and subtraction
- undo multiplication and division



E Solution:

$P =$ Sum of all sides

$$78 = (x + 3) + 2x + (x + 3) + 5x$$

$$78 = 9x + 6$$

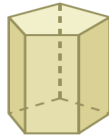
$$\color{red}{-6} \quad \quad \color{red}{-6}$$

$$72 = 9x$$

$$\frac{72}{\color{red}{9}} = \frac{9x}{\color{red}{9}}$$

$$8 = x$$

So, the value of x is 8.



8

F Graph the line that passes through the two points $(-2, 2)$ and $(0, -2)$. Then find the slope of the line.



"I am doing an experiment with slope. I want you to run up and down the board 10 times."



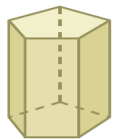
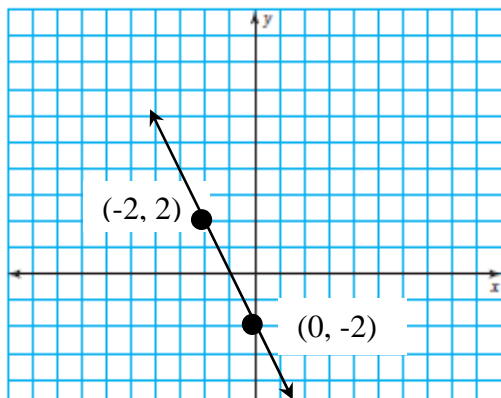
Your next card will look like this!

Key Ideas

An **ordered pair** (x, y) is a pair of numbers that is used to locate a point in a coordinate plane.

Slope is the rate of change between any two points on a line.

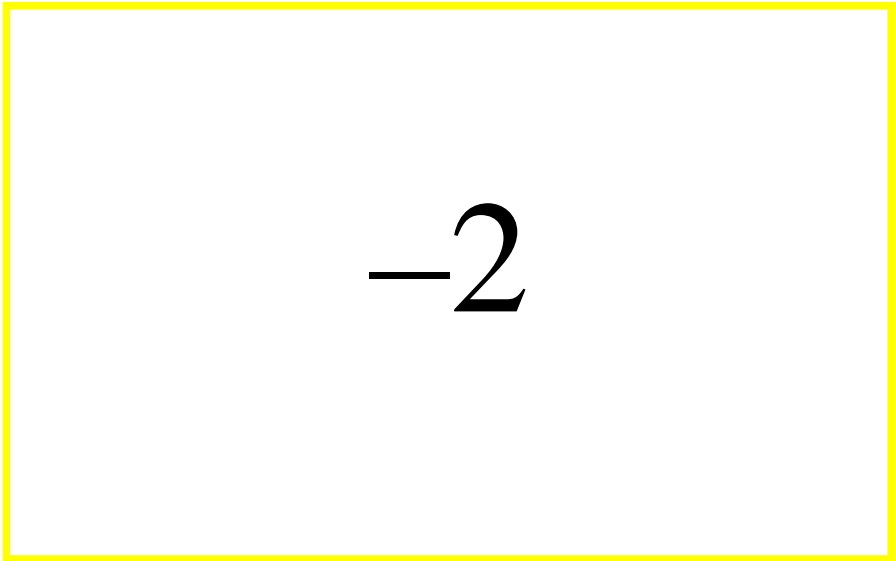
To find the **slope** of a line, find the ratio of the vertical change to the horizontal change.

F**Solution:**

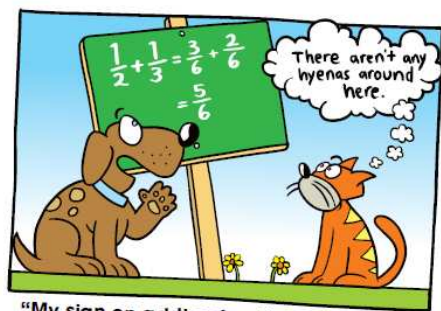
The two points are plotted as shown.

$$\text{Slope: } \frac{\text{change in } y}{\text{change in } x} = \frac{-4}{2} = -2$$

So, the slope is -2 .

**G** What is the difference of

$$-1\frac{7}{10} \text{ and } 2\frac{4}{5}?$$



"My sign on adding fractions with unlike denominators is keeping the hyenas away."



Your next card will look like this!

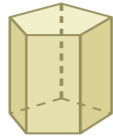
Key Ideas

To subtract a rational number, add its *opposite*.

To add rational numbers, rewrite each number using the **LCD** (least common denominator), add the numerators and simplify.

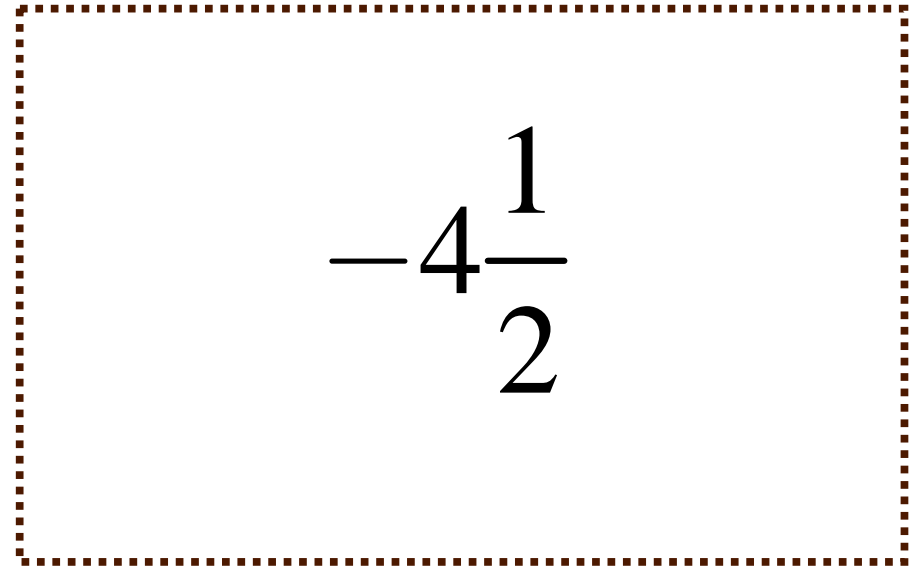


G Solution:

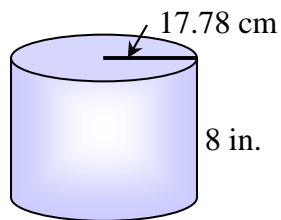


$$\begin{aligned} & -1\frac{7}{10} - 2\frac{4}{5} \\ &= -1\frac{7}{10} + \left(-2\frac{4}{5}\right) \\ &= \frac{-17}{10} + \left(\frac{-14}{5}\right) \\ &= \frac{-17}{10} + \left(\frac{-28}{10}\right) \\ &= \frac{-45}{10} \\ &= -4\frac{1}{2} \end{aligned}$$

So, the difference is $-4\frac{1}{2}$.



H Find the surface area of the cylinder in square inches. Round your answer to the nearest tenth.



$$1 \text{ in.} \approx 2.54 \text{ cm}$$

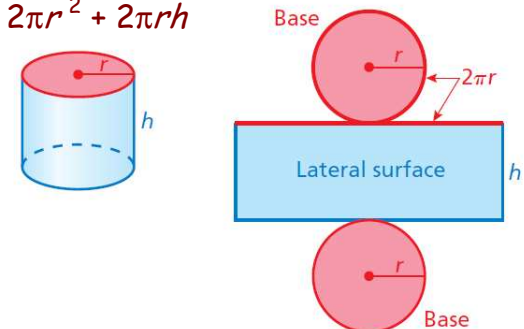


Your next card will look like this!

Key Ideas

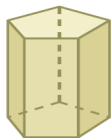
The surface area of a cylinder is the sum of the areas of the bases and the lateral surface.

$$\text{Surface Area: } S = 2\pi r^2 + 2\pi rh$$



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H Solution:



First, convert all units to inches.

$$17.78 \text{ cm} \times \frac{1 \text{ in.}}{2.54 \text{ cm}} \approx 7 \text{ in.}$$

Then, find the surface area.

$$\begin{aligned} S &= 2\pi r^2 + 2\pi rh \\ &= 2\pi(7)^2 + 2\pi(7)(8) \\ &= 98\pi + 112\pi \\ &= 210\pi \\ &\approx 659.7 \text{ in.}^2 \end{aligned}$$

The surface area is about 659.7 square inches.

659.7 in.²

I In a coordinate plane, draw the figures with the given vertices. Which figures are similar? Explain your reasoning.

Triangle A: (0, 0), (9, 0), (0, 9)

Triangle B: (0, 0), (6, 0), (0, 9)

Triangle C: (0, 0), (6, 0), (0, 6)



Congratulations!

Once you have checked the solution with your teacher, your group is all done!

Key Ideas

Figures that have the same shape but not necessarily the same size are called *similar figures*.

Two figures are *similar* if corresponding side lengths are proportional, and corresponding angles have the same measure.



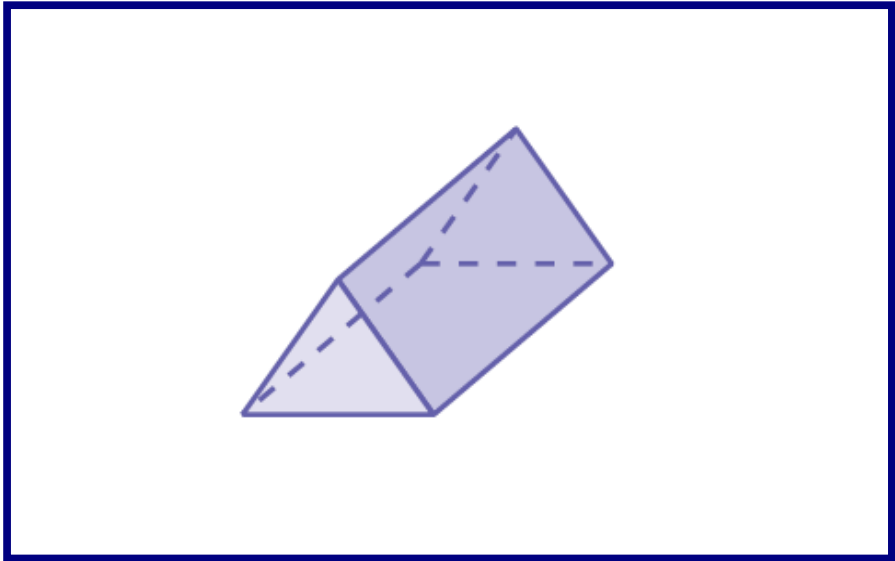
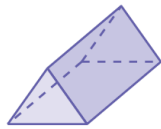
Scavenger Hunt Review Game
Blue Book
Big Ideas Learning

A Solution:

A *triangular prism* is a solid that has two parallel triangular bases. So, the solid shown is a triangular prism.



Each card for your group should have this solid. If you do not see a triangular prism, go back and try again.

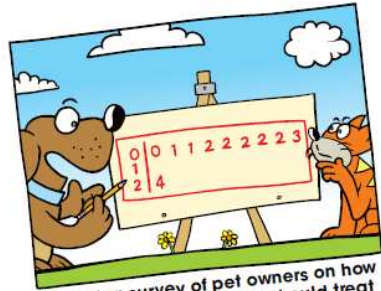


B Make a stem-and-leaf plot of the number of songs downloaded.

Songs Downloaded			
33	14	5	63
45	43	20	5
60	15	31	9



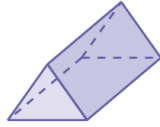
Your next card will look like this!



Key Idea

A **stem-and-leaf** plot uses the digits of the data values to organize a data set. Each data value is broken into a stem (digit or digits on the left) and a leaf (digit or digits on the right).

B Solution:



To make a stem-and-leaf plot:

1. Order the data.
2. Choose the stems and the leaves. Because the data values range from 5 to 63, use the *tens* digits for the stems and the *ones* digits for the leaves.
3. Write the *stems* to the left of the vertical line.
4. Write the *leaves* for each stem to the right of the vertical line.

The stem-and-leaf plot is shown on the front with a title and a key.

Songs Downloaded

Stem	Leaves
0	5 5 9
1	4 5
2	0
3	1 3
4	3 5
5	
6	0 3

Key: 1 | 4 = 14 songs

C It costs \$41.25 for 5 tickets to the movies. Write and solve a proportion to determine how much 4 tickets will cost.



"I got 15 on my online test. That's 105 in dog points! Isn't that an A+?"

Key Ideas

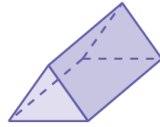
A **proportion** is an equation stating that two ratios are equivalent.

To solve a proportion, use the **Multiplication Property of Equality** or the **Cross Products Property**.



Your next card will look like this!

C Solution:



First, write a proportion.

$$\frac{41.25}{5} = \frac{x}{4}$$

← dollars
← tickets

$$41.25 \cdot 4 = 5 \cdot x \quad \text{Cross Products Property.}$$
$$165 = 5x \quad \text{Multiply.}$$
$$33 = x \quad \text{Divide.}$$

So, it will cost \$33 for 4 tickets to the movies.



D Evaluate the expression

$$x^2 - |y - 2| + \frac{12}{x}$$

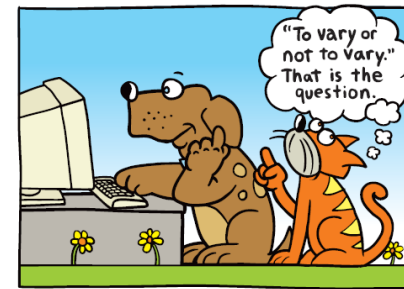
when $x = -1$ and $y = 3$.



Your next card will look like this!

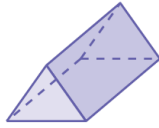
Key Idea

Use the *order of operations* when evaluating an expression.



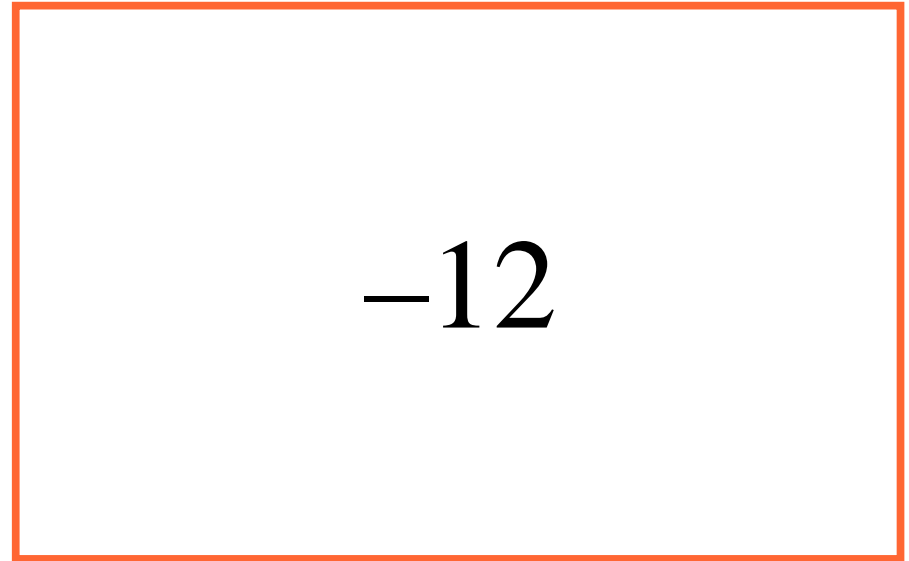
"Dear Sir: Yesterday you said $x = 2$. Today you are saying $x = 3$. Please make up your mind."

D Solution:

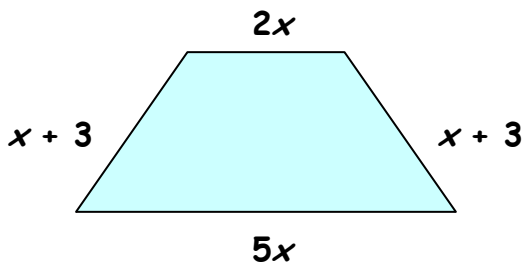


Use substitution for $x = -1$ and $y = 3$.

$$\begin{aligned} & x^2 - |y - 2| + \frac{12}{x} \\ &= (-1)^2 - |(3) - 2| + \frac{12}{-1} \\ &= 1 - |1| + (-12) \\ &= 1 - 1 + (-12) \\ &= 1 + (-1) + (-12) \\ &= -12 \end{aligned}$$



E The perimeter of the trapezoid is 60.
What is the value of x ?



Your next card will look like this!

Key Ideas

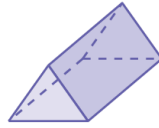
The perimeter of a figure is the sum of the sides.

To solve an equation:

- combine like terms
- undo addition and subtraction
- undo multiplication and division



E Solution:



$P =$ Sum of all sides

$$60 = (x + 3) + 2x + (x + 3) + 5x$$

$$60 = 9x + 6$$

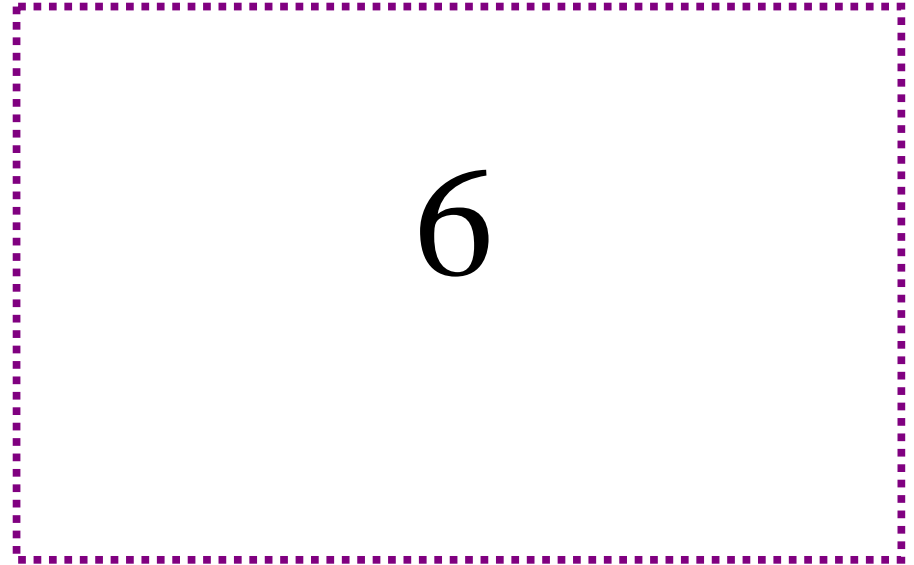
$$\color{red}{-6} \quad \quad \color{red}{-6}$$

$$54 = 9x$$

$$\frac{54}{\color{red}{9}} = \frac{9x}{\color{red}{9}}$$

$$6 = x$$

So, the value of x is 6.



F Graph the line that passes through the two points $(-2, 2)$ and $(1, 1)$. Then find the slope of the line.



"I am doing an experiment with slope. I want you to run up and down the board 10 times."



Your next card will look like this!

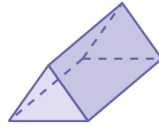
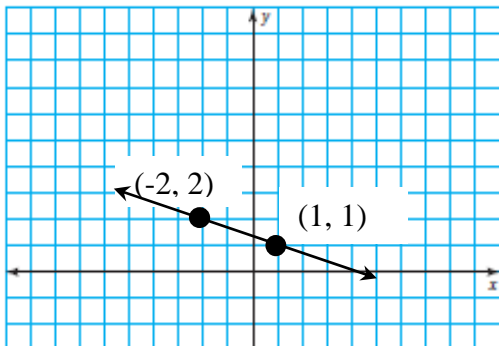
Key Ideas

An **ordered pair** (x, y) is a pair of numbers that is used to locate a point in a coordinate plane.

Slope is the rate of change between any two points on a line.

To find the **slope** of a line, find the ratio of the vertical change to the horizontal change.

F



Solution:

The two points are plotted as shown.

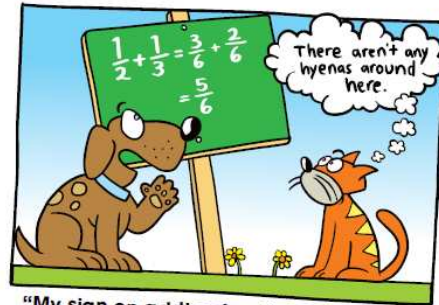
$$\text{Slope: } \frac{\text{change in } y}{\text{change in } x} = \frac{-1}{3}$$

So, the slope is $-\frac{1}{3}$.

$$\frac{1}{3}$$

G What is the difference of

$$-1\frac{4}{5} \text{ and } 3\frac{3}{10}?$$



"My sign on adding fractions with unlike denominators is keeping the hyenas away."



Your next card will look like this!

Key Ideas

To subtract a rational number, add its *opposite*.

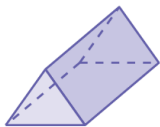
To add rational numbers, rewrite each number using the **LCD** (least common denominator), add the numerators and simplify.



G Solution:

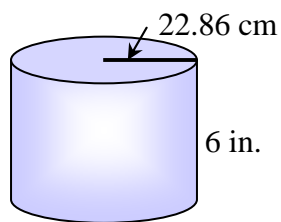
$$\begin{aligned} & -1\frac{4}{5} - 3\frac{3}{10} \\ &= -1\frac{4}{5} + \left(-3\frac{3}{10}\right) \\ &= \frac{-9}{5} + \frac{-33}{10} \\ &= \frac{-18}{10} + \frac{-33}{10} \\ &= \frac{-51}{10} \\ &= -5\frac{1}{10} \end{aligned}$$

So, the difference is $-5\frac{1}{10}$.



$$-5\frac{1}{10}$$

H Find the surface area of the cylinder in square inches. Round your answer to the nearest tenth.



$$1 \text{ in.} \approx 2.54 \text{ cm}$$

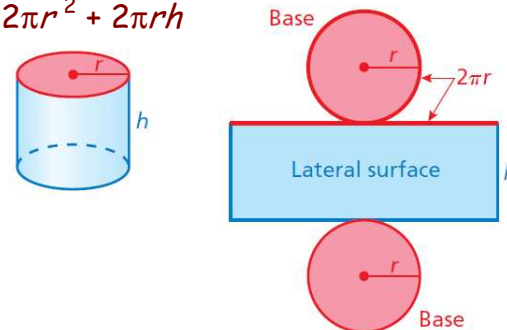


Your next card will look like this!

Key Ideas

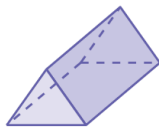
The surface area of a cylinder is the sum of the areas of the bases and the lateral surface.

$$\text{Surface Area: } S = 2\pi r^2 + 2\pi rh$$



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H Solution:



First, convert all units to inches.

$$22.86 \text{ cm} \times \frac{1 \text{ in.}}{2.54 \text{ cm}} \approx 9 \text{ in.}$$

Then, find the surface area.

$$\begin{aligned} S &= 2\pi r^2 + 2\pi rh \\ &= 2\pi(9)^2 + 2\pi(9)(6) \\ &= 162\pi + 108\pi \\ &= 270\pi \\ &\approx 848.2 \text{ in.}^2 \end{aligned}$$

The surface area is about 848.2 square inches.

848.2 in.²

I In a coordinate plane, draw the figures with the given vertices. Which figures are similar? Explain your reasoning.

Triangle A: (0, 0), (9, 0), (0, 9)

Triangle B: (0, 0), (6, 0), (0, 9)

Triangle C: (0, 0), (6, 0), (0, 6)



Congratulations!

Once you have checked the solution with your teacher, your group is all done!

Key Ideas

Figures that have the same shape but not necessarily the same size are called *similar figures*.

Two figures are *similar* if corresponding side lengths are proportional, and corresponding angles have the same measure.



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A Solution:

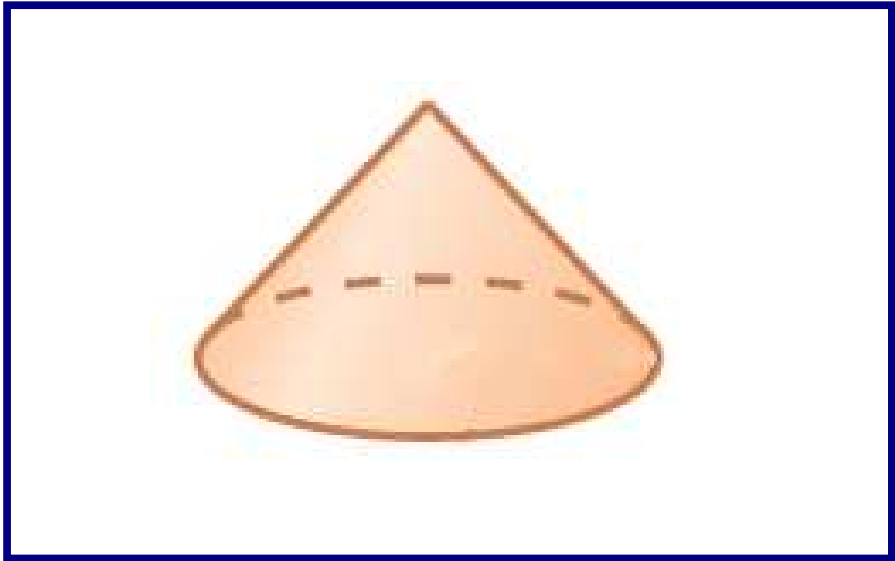
A **cone** is a solid that has one circular base. So, the solid shown is a cone.



Each card for your group should have this solid. If you do not see a cone, go back and try again.



Descartes

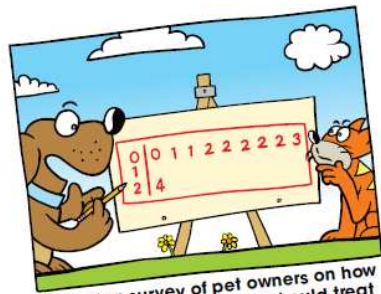


B Make a stem-and-leaf plot of the number of songs downloaded.

Songs Downloaded			
41	14	5	63
45	61	20	15
27	5	31	9



Your next card will look like this!



"I took a survey of pet owners on how many times per day you should treat your dog to a biscuit."

Key Idea

A **stem-and-leaf** plot uses the digits of the data values to organize a data set. Each data value is broken into a stem (digit or digits on the left) and a leaf (digit or digits on the right).

B Solution:



To make a stem-and-leaf plot:

1. Order the data.
2. Choose the stems and the leaves. Because the data values range from 5 to 63, use the *tens* digits for the stems and the *ones* digits for the leaves.
3. Write the *stems* to the left of the vertical line.
4. Write the *leaves* for each stem to the right of the vertical line.

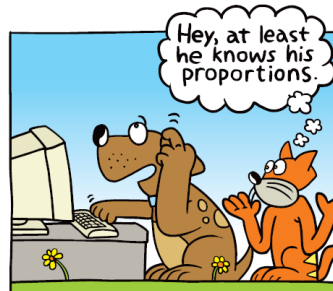
The stem-and-leaf plot is shown on the front with a title and a key.

Songs Downloaded

Stem	Leaves
0	5 5 9
1	4 5
2	0 7
3	1
4	1 5
5	
6	1 3

Key: 1 | 4 = 14 songs

C It costs \$41.25 for 5 tickets to the movies. Write and solve a proportion to determine how much 9 tickets will cost.



"I got 15 on my online test. That's 105 in dog points! Isn't that an A+?"

Key Ideas

A **proportion** is an equation stating that two ratios are equivalent.

To solve a proportion, use the **Multiplication Property of Equality** or the **Cross Products Property**.



Your next card will look like this!

C Solution:



First, write a proportion.

$$\frac{41.25}{5} = \frac{x}{9}$$

← dollars
← tickets

$$41.25 \cdot 9 = 5 \cdot x \quad \text{Cross Products Property.}$$
$$371.25 = 5x \quad \text{Multiply.}$$
$$74.25 = x \quad \text{Divide.}$$

So, it will cost \$74.25 for 9 tickets to the movies.



D Evaluate the expression

$$x^2 - |y - 2| + \frac{12}{x}$$

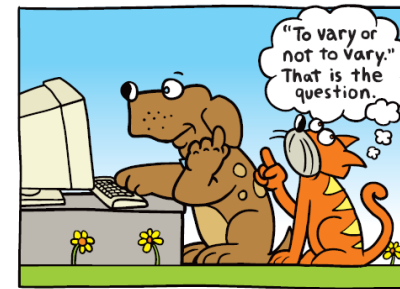
when $x = 1$ and $y = -2$.



Your next card will look like this!

Key Idea

Use the *order of operations* when evaluating an expression.



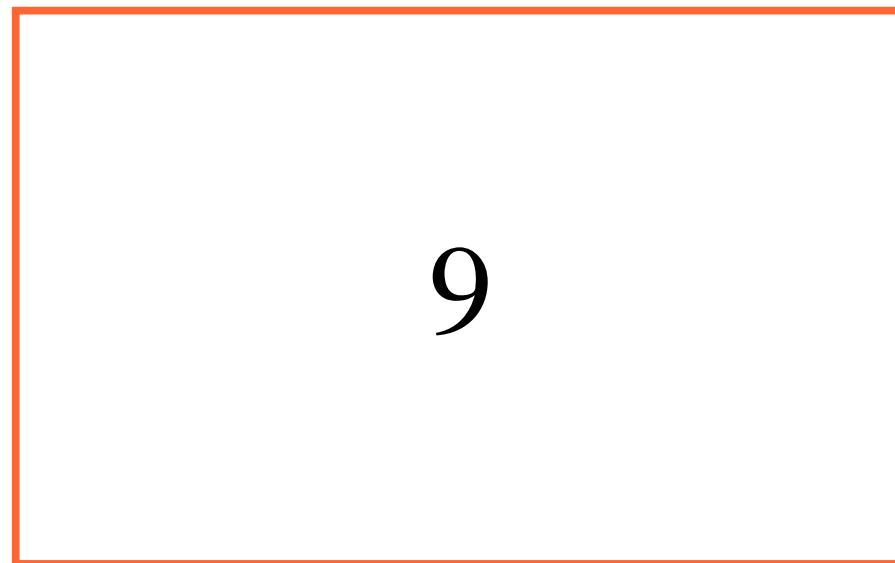
"Dear Sir: Yesterday you said $x = 2$. Today you are saying $x = 3$. Please make up your mind."

D Solution:

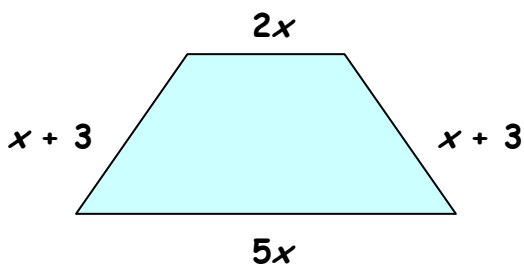


Use substitution for $x = 1$ and $y = -2$.

$$\begin{aligned} & x^2 - |y - 2| + \frac{12}{x} \\ &= (1)^2 - |(-2) - 2| + \frac{12}{1} \\ &= 1 - |-4| + 12 \\ &= 1 - 4 + 12 \\ &= 1 + (-4) + 12 \\ &= 9 \end{aligned}$$



E The perimeter of the trapezoid is 96.
What is the value of x ?



Your next card will look like this!

Key Ideas

The perimeter of a figure is the sum of the sides.

To solve an equation:

- combine like terms
- undo addition and subtraction
- undo multiplication and division



E Solution:

$P =$ Sum of all sides

$$96 = (x + 3) + 2x + (x + 3) + 5x$$

$$96 = 9x + 6$$

$$\color{red}{-6} \quad \quad \color{red}{-6}$$

$$90 = 9x$$

$$\frac{90}{\color{red}{9}} = \frac{9x}{\color{red}{9}}$$

$$10 = x$$

So, the value of x is 10.



10

F Graph the line that passes through the two points $(-2, 2)$ and $(3, 4)$. Then find the slope of the line.



"I am doing an experiment with slope. I want you to run up and down the board 10 times."



Your next card will look like this!

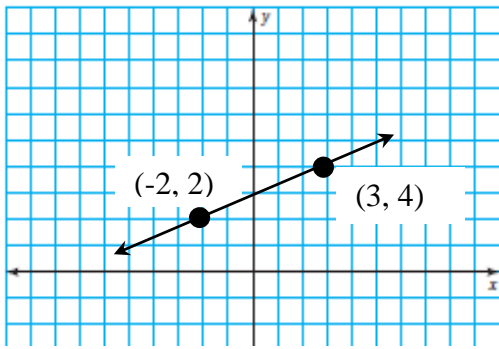
Key Ideas

An **ordered pair** (x, y) is a pair of numbers that is used to locate a point in a coordinate plane.

Slope is the rate of change between any two points on a line.

To find the **slope** of a line, find the ratio of the vertical change to the horizontal change.

F



Solution:

The two points are plotted as shown.

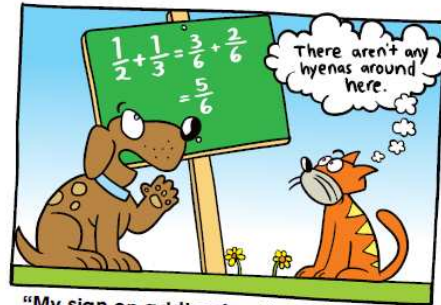
$$\text{Slope: } \frac{\text{change in } y}{\text{change in } x} = \frac{2}{5}$$

So, the slope is $\frac{2}{5}$.

2
—
5

G What is the difference of

$$1\frac{7}{10} \text{ and } -2\frac{4}{5}?$$



"My sign on adding fractions with unlike denominators is keeping the hyenas away."



Your next card will look like this!

Key Ideas

To subtract a rational number, add its *opposite*.

To add rational numbers, rewrite each number using the **LCD** (least common denominator), add the numerators and simplify.

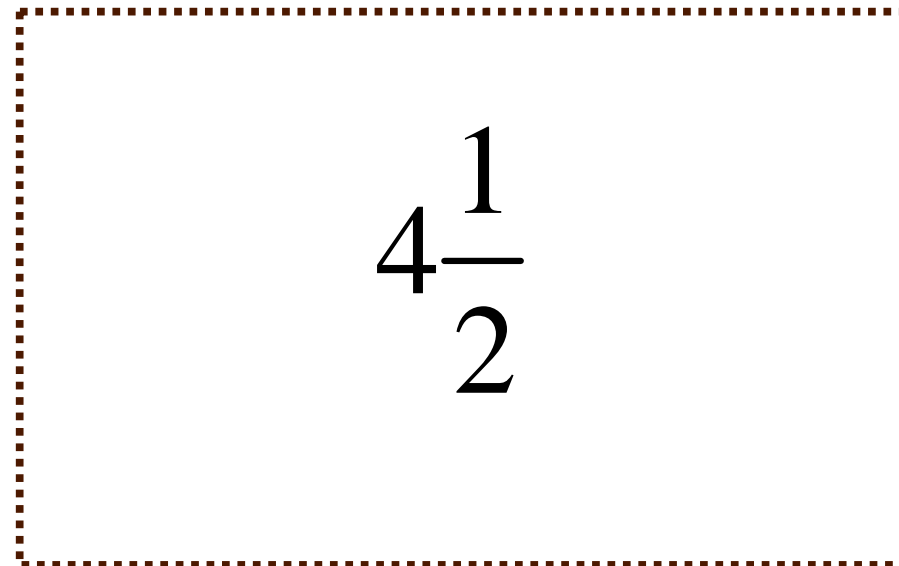


G Solution:

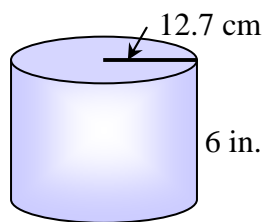


$$\begin{aligned} & 1\frac{7}{10} - \left(-2\frac{4}{5}\right) \\ &= 1\frac{7}{10} + \left(2\frac{4}{5}\right) \\ &= \frac{17}{10} + \frac{14}{5} \\ &= \frac{17}{10} + \frac{28}{10} \\ &= \frac{45}{10} \\ &= 4\frac{1}{2} \end{aligned}$$

So, the difference is $4\frac{1}{2}$.



H Find the surface area of the cylinder in square inches. Round your answer to the nearest tenth.



$$1 \text{ in.} \approx 2.54 \text{ cm}$$

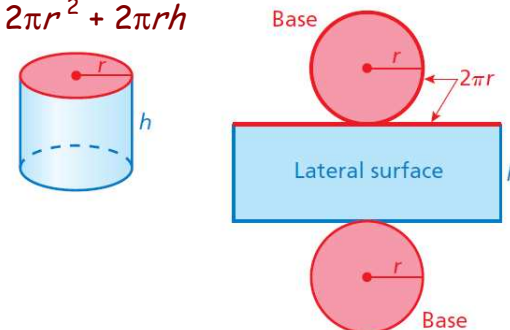


Your next card will look like this!

Key Ideas

The surface area of a cylinder is the sum of the areas of the bases and the lateral surface.

$$\text{Surface Area: } S = 2\pi r^2 + 2\pi rh$$



H Solution:



First, convert all units to inches.

$$12.7 \text{ cm} \times \frac{1 \text{ in.}}{2.54 \text{ cm}} \approx 5 \text{ in.}$$

Then, find the surface area.

$$\begin{aligned} S &= 2\pi r^2 + 2\pi rh \\ &= 2\pi(5)^2 + 2\pi(5)(6) \\ &= 50\pi + 60\pi \\ &= 110\pi \\ &\approx 345.6 \text{ in.}^2 \end{aligned}$$

The surface area is about 345.6 square inches.

345.6 in.²

I In a coordinate plane, draw the figures with the given vertices. Which figures are similar? Explain your reasoning.

Triangle A: (0, 0), (9, 0), (0, 9)

Triangle B: (0, 0), (6, 0), (0, 9)

Triangle C: (0, 0), (6, 0), (0, 6)



Congratulations!

Once you have checked the solution with your teacher, your group is all done!

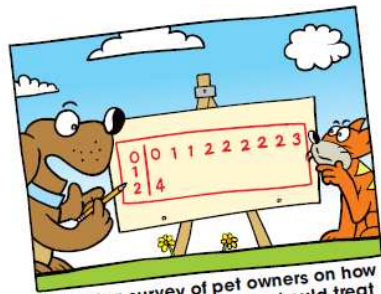
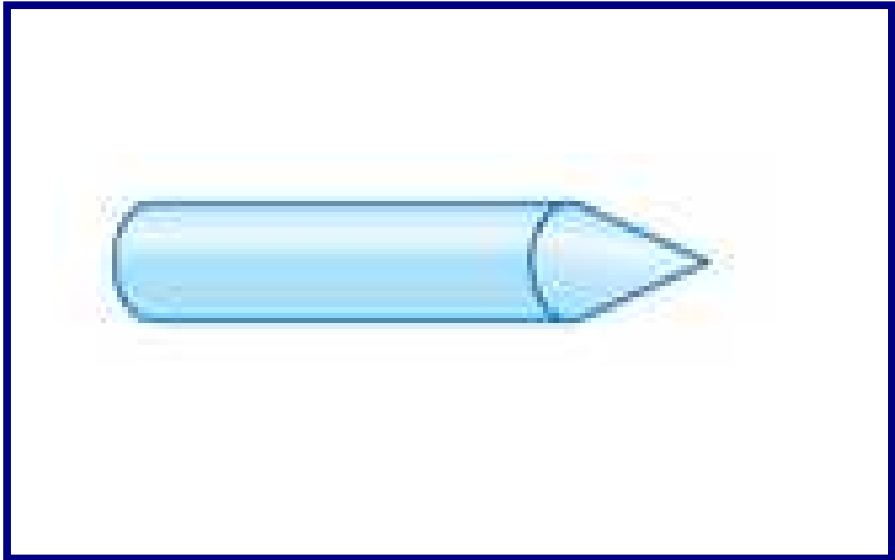
Key Ideas

Figures that have the same shape but not necessarily the same size are called *similar figures*.

Two figures are *similar* if corresponding side lengths are proportional, and corresponding angles have the same measure.



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"I took a survey of pet owners on how many times per day you should treat your dog to a biscuit."

Key Idea

A **stem-and-leaf** plot uses the digits of the data values to organize a data set. Each data value is broken into a stem (digit or digits on the left) and a leaf (digit or digits on the right).

Songs Downloaded

Stem	Leaves
0	5 8 8 9
1	2 4 5 8
2	0
3	1 4
4	5

Key: 1 | 4 = 14 songs

Key Ideas

A *proportion* is an equation stating that two ratios are equivalent.

To solve a proportion, use the **Multiplication Property of Equality** or the **Cross Products Property**.

\$7.50

Key Idea

Use the *order of operations* when evaluating an expression.



"Dear Sir: Yesterday you said $x = 2$.
Today you are saying $x = 3$.
Please make up your mind."

12

Key Ideas

The perimeter of a figure is the sum of the sides.

To solve an equation:

- combine like terms
- undo addition and subtraction
- undo multiplication and division



1

Key Ideas

An *ordered pair* (x, y) is a pair of numbers that is used to locate a point in a coordinate plane.

Slope is the rate of change between any two points on a line.

To find the **slope** of a line, find the ratio of the vertical change to the horizontal change.

$$-\frac{5}{2}$$

Key Ideas

To subtract a rational number, add its *opposite*.

To add rational numbers, rewrite each number using the **LCD** (least common denominator), add the numerators and simplify.

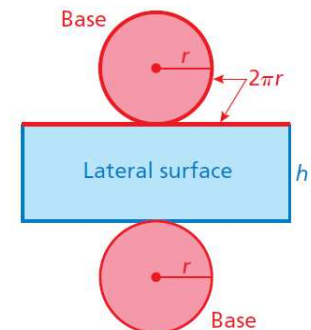
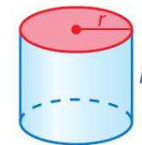


$$1\frac{1}{10}$$

Key Ideas

The surface area of a cylinder is the sum of the areas of the bases and the lateral surface.

Surface Area: $S = 2\pi r^2 + 2\pi rh$



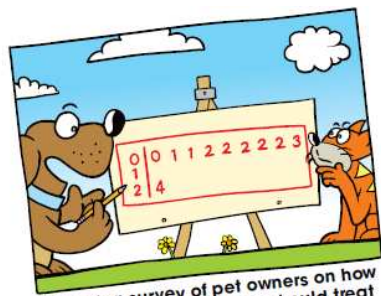
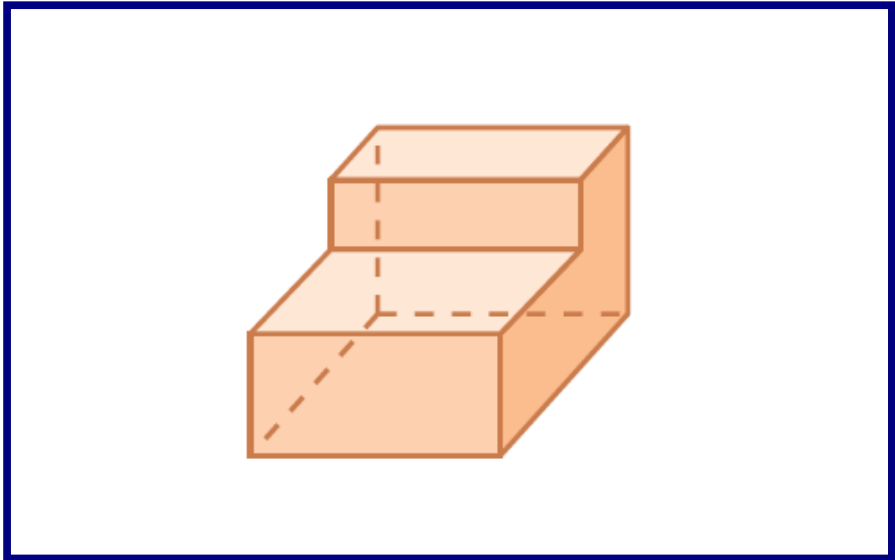
1492.2 in.²

Key Ideas

Figures that have the same shape but not necessarily the same size are called *similar figures*.

Two figures are *similar* if corresponding side lengths are proportional, and corresponding angles have the same measure.





"I took a survey of pet owners on how many times per day you should treat your dog to a biscuit."

Key Idea

A **stem-and-leaf** plot uses the digits of the data values to organize a data set. Each data value is broken into a stem (digit or digits on the left) and a leaf (digit or digits on the right).

Songs Downloaded

Stem	Leaves
0	5 9 9
1	2 2 3 4
2	0 5
3	1 4
4	5

Key: 1 | 4 = 14 songs

Key Ideas

A *proportion* is an equation stating that two ratios are equivalent.

To solve a proportion, use the **Multiplication Property of Equality** or the **Cross Products Property**.

\$8.25

Key Idea

Use the *order of operations* when evaluating an expression.



"Dear Sir: Yesterday you said $x = 2$.
Today you are saying $x = 3$.
Please make up your mind."

-5

Key Ideas

The perimeter of a figure is the sum of the sides.

To solve an equation:

- combine like terms
- undo addition and subtraction
- undo multiplication and division



7

Key Ideas

An *ordered pair* (x, y) is a pair of numbers that is used to locate a point in a coordinate plane.

Slope is the rate of change between any two points on a line.

To find the **slope** of a line, find the ratio of the vertical change to the horizontal change.

$$\frac{3}{2}$$

Key Ideas

To subtract a rational number, add its *opposite*.

To add rational numbers, rewrite each number using the **LCD** (least common denominator), add the numerators and simplify.

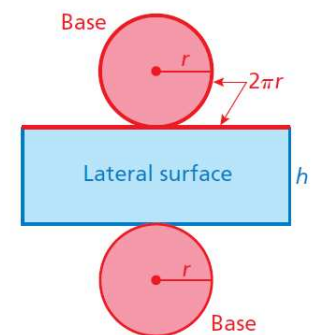
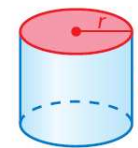


$$-3\frac{1}{2}$$

Key Ideas

The surface area of a cylinder is the sum of the areas of the bases and the lateral surface.

Surface Area: $S = 2\pi r^2 + 2\pi rh$

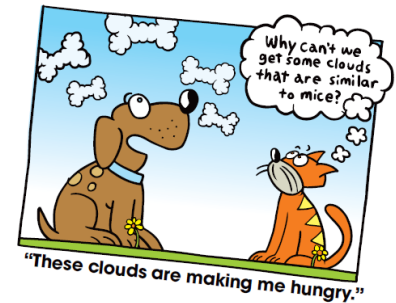


571.8 in.²

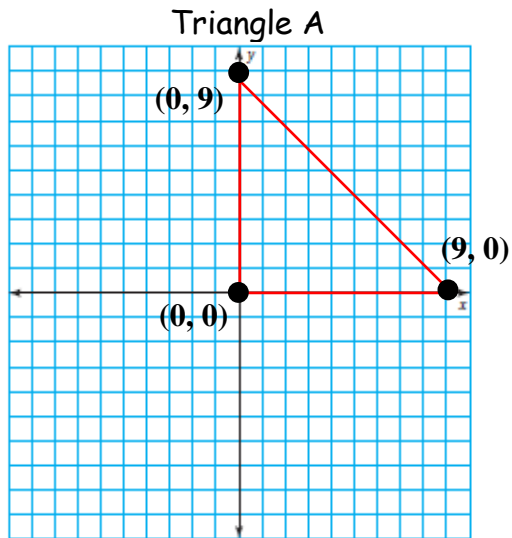
Key Ideas

Figures that have the same shape but not necessarily the same size are called *similar figures*.

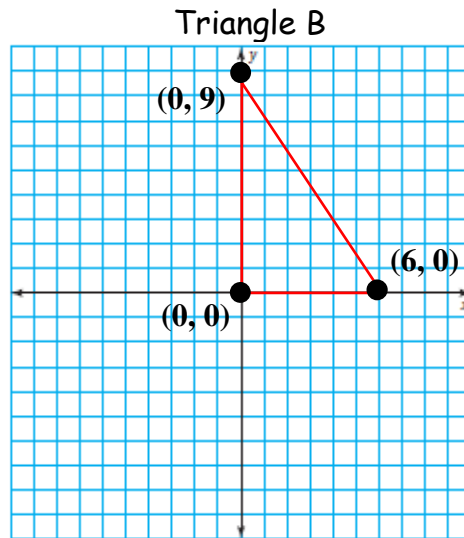
Two figures are *similar* if corresponding side lengths are proportional, and corresponding angles have the same measure.



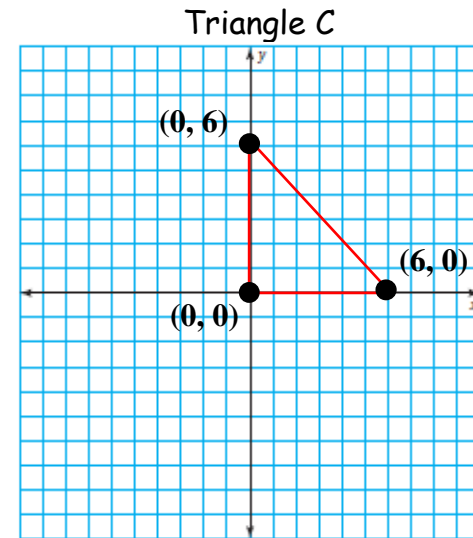
I



$$\frac{\text{leg 1 of A}}{\text{leg 2 of A}} = \frac{9}{9} = 1$$



$$\frac{\text{leg 1 of B}}{\text{leg 2 of B}} = \frac{6}{9} = \frac{2}{3}$$



$$\frac{\text{leg 1 of C}}{\text{leg 2 of C}} = \frac{6}{6} = 1$$

Solution:
Triangles A and C are similar because corresponding side lengths are proportional and corresponding angles have the same measure.