**Big Ideas Math®**

# Gettin' Triggy with Triangles

## ▶ Materials:
- Game cards
- Paper
- Pencil
- Calculator
- Answer sheet
- Score chart

## ▶ Directions:
Students work in teams of three. Each team needs a set of game cards and a score chart, and each student needs an answer sheet. One student flips over a game card for all others to see. Each student solves for the unknown side length of the triangle and the three trigonometric ratios of angle $\theta$. Give exact values for side lengths and round trigonometric ratios to four decimal places when necessary.

Students write the side length and values of the trigonometric ratios on their answer sheet. Once all team members are done, they check their answers. Each correct answer is worth one point, and the student who finished first with all correct answers earns three extra points. All students use the score chart to keep a running total of points.

The process continues until all cards are completed, or time is called.

## ▶ Who Wins?
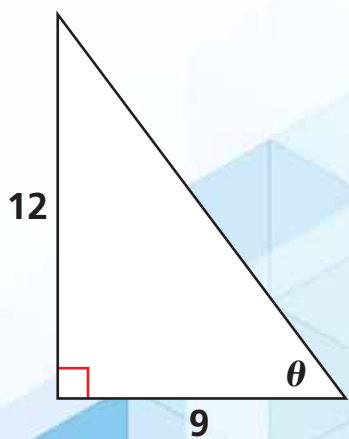The student with the highest score wins.

## ▶ Tip:
It may help students to label what each side (opposite, adjacent, or hypotenuse) is according to the angle being used.
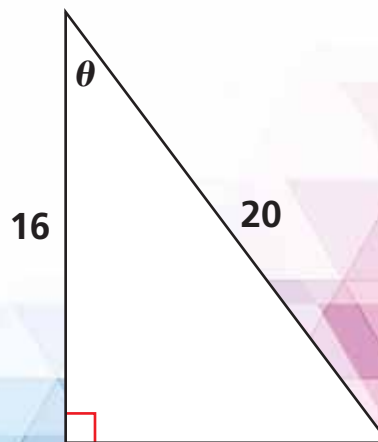
## ▶ Variations:
- Ask students to find the values of all six trigonometric ratios of angle $\theta$.
- Label the other acute angle of the triangle $\beta$ and ask students to find the value of the sine, cosine, and tangent ratios of angle $\beta$.
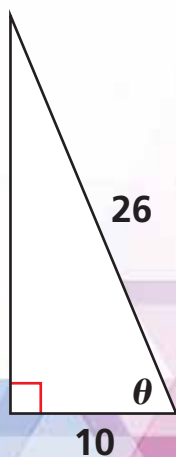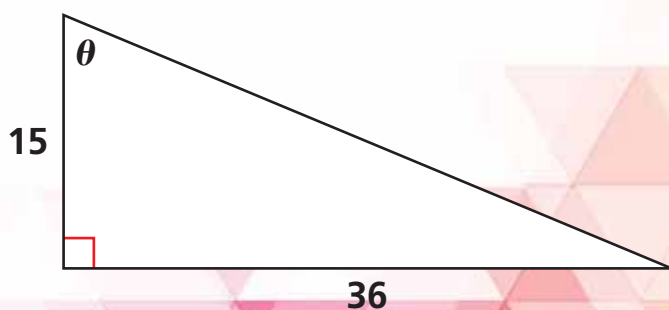
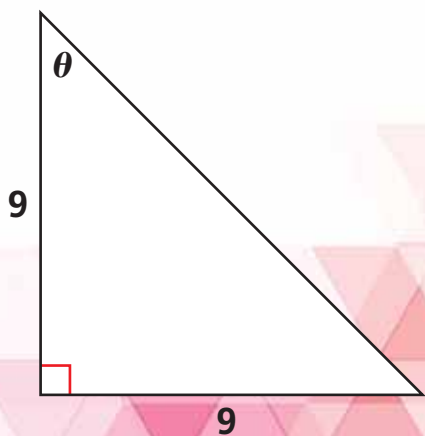**BIG IDEAS LEARNING®**
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**Triangle 1**

12

9

$\theta$

**Triangle 2**

$\theta$

16

20

**Triangle 3**

26

10

$\theta$

**Triangle 4**

$\theta$

15

36

**Triangle 5**

$\theta$

9

9

**Triangle 6**

4

8

$\theta$

**Triangle 7**

$5\sqrt{3}$

10

$\theta$

**Triangle 8**

$\theta$

$7\sqrt{2}$

7

**Triangle 9**

$\theta$

$\sqrt{58}$

3

**Triangle 10**

4

$\theta$

6

**Triangle 11**

$\theta$

$\sqrt{233}$

8

**Triangle 12**

6

$\theta$
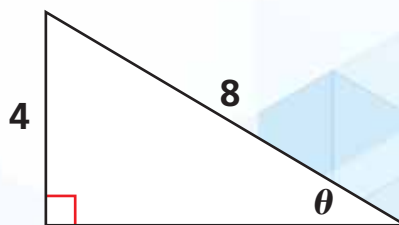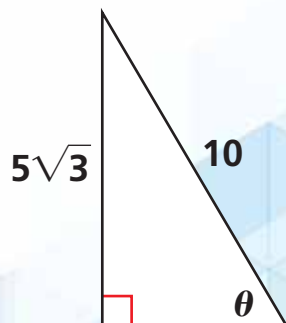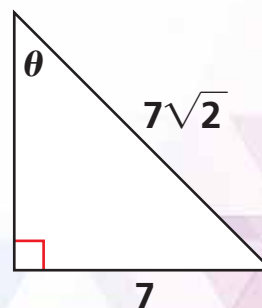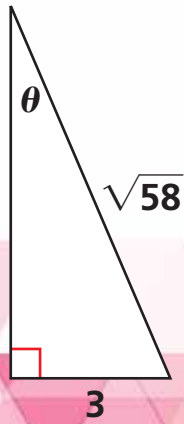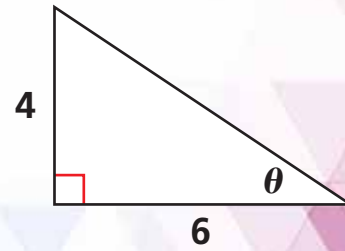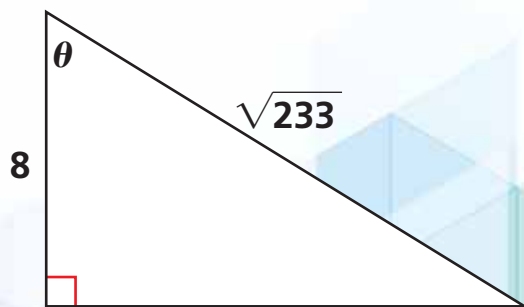
12

Answer sheet for Gettin' Triggy with Triangles

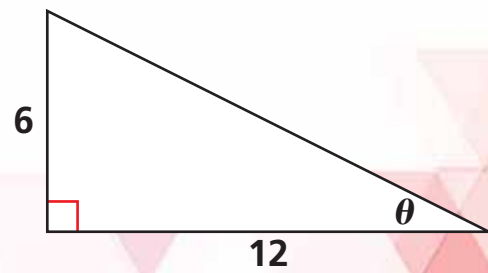| Triangle # | Missing Length | sin $\theta$ | cos $\theta$ | tan $\theta$ |
|---|---|---|---|---|
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Score chart for Gettin' Triggy with Triangles

| Player 1 | Player 2 | Player 3 |
|----------|----------|----------|
|          |          |          |

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Score chart for Gettin' Triggy with Triangles

| Player 1 | Player 2 | Player 3 |
|----------|----------|----------|
|          |          |          |

Answers for Gettin' Triggy with Triangles

**1.** missing length $= 15$, $\sin \theta = 0.8$, $\cos \theta = 0.6$, $\tan \theta \approx 1.3333$

**2.** missing length $= 12$, $\sin \theta = 0.6$, $\cos \theta = 0.8$, $\tan \theta = 0.75$

**3.** missing length $= 24$, $\sin \theta \approx 0.9231$, $\cos \theta \approx 0.3846$, $\tan \theta = 2.4$

**4.** missing length $= 39$, $\sin \theta \approx 0.9231$, $\cos \theta \approx 0.3846$, $\tan \theta = 2.4$

**5.** missing length $= 9\sqrt{2}$, $\sin \theta \approx 0.7071$, $\cos \theta \approx 0.7071$, $\tan \theta = 1$

**6.** missing length $= 4\sqrt{3}$, $\sin \theta = 0.5$, $\cos \theta \approx 0.8660$, $\tan \theta \approx 0.5774$

**7.** missing length $= 5$, $\sin \theta \approx 0.8660$, $\cos \theta = 0.5$, $\tan \theta \approx 1.7321$

**8.** missing length $= 7$, $\sin \theta \approx 0.7071$, $\cos \theta \approx 0.7071$, $\tan \theta = 1$

**9.** missing length $= 7$, $\sin \theta \approx 0.3939$, $\cos \theta \approx 0.9191$, $\tan \theta \approx 0.4286$

**10.** missing length $= 2\sqrt{13}$, $\sin \theta \approx 0.5547$, $\cos \theta \approx 0.8321$, $\tan \theta \approx 0.6667$

**11.** missing length $= 13$, $\sin \theta \approx 0.8517$, $\cos \theta \approx 0.5241$, $\tan \theta = 1.625$

**12.** missing length $= 6\sqrt{5}$, $\sin \theta \approx 0.4472$, $\cos \theta \approx 0.8944$, $\tan \theta = 0.5$