REVIEW: Prime and Composite Numbers

Name _____

Key Concept and Vocabulary

A **prime number** has only 1 and itself as factors. The first 5 prime numbers are 2, 3, 5, 7, and 11.

$$24 = 2 \cdot 2 \cdot 2 \cdot 3$$

composite   prime factorization

Prime Numbers

Visual Model

You can use a **factor tree** to find the prime factorization of a composite number.

```
      60
     /  \
    2   30
        / \
       2  15
          / \
         3   5
```

$$60 = 2 \cdot 2 \cdot 3 \cdot 5$$
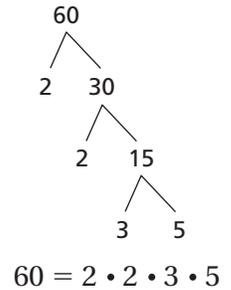
Skill Examples

Prime Factorization

1. $30 = 2 \cdot 3 \cdot 5$

2. $42 = 2 \cdot 3 \cdot 7$

3. $81 = 3 \cdot 3 \cdot 3 \cdot 3$

4. $91 = 7 \cdot 13$

5. $89 = 89$ (Prime)

Application Example

6. You get a paycheck every 2 weeks. Your annual salary is $30,000. Can you get the same amount for each paycheck?

$$30,000 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 5 \cdot 5 \cdot 5 \cdot 5$$

∴ 30,000 is not divisible by 13, so you cannot have 26 paychecks of equal size.

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Check your answers at BigIdeasMath.com.

Write the prime factorization of the number.

7. $45 = \underline{\quad 3 \cdot 3 \cdot 5 \quad}$

8. $100 = \underline{\quad 2 \cdot 2 \cdot 5 \cdot 5 \quad}$

9. $63 = \underline{\quad 3 \cdot 3 \cdot 7 \quad}$

10. $256 = \underline{\quad 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \quad}$

11. $54 = \underline{\quad 2 \cdot 3 \cdot 3 \cdot 3 \quad}$

12. $55 = \underline{\quad 5 \cdot 11 \quad}$

13. $121 = \underline{\quad 11 \cdot 11 \quad}$

14. $98 = \underline{\quad 2 \cdot 7 \cdot 7 \quad}$

15. $113 = \underline{\quad 113 \text{ (prime)} \quad}$

16. Use a factor tree to find the prime factorization of 36.

    Sample factor tree:

```
      36
     /  \
    4    9
   / \  / \
  2  2 3   3
```

$$36 = 2 \cdot 2 \cdot 3 \cdot 3$$
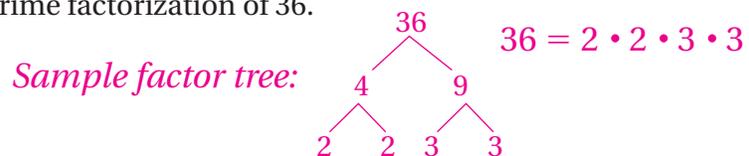
17. **EQUAL PAYCHECKS** You get a paycheck every 2 weeks. Your annual salary is $39,000. Can you get the same amount for each paycheck? Explain why or why not.

    yes; $39,000 = 2 \cdot 2 \cdot 2 \cdot 3 \cdot 5 \cdot 5 \cdot 5 \cdot 13$; Because 39,000 is divisible by 2 and 13, you can have 26 paychecks of $1500.

18. **LISTING PRIME NUMBERS** List all the prime numbers that are less than 50.

    2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47