REVIEW: Order of Operations with Exponents

Name _____

Key Concept and Vocabulary

Order of Operations

1. Perform operations in grouping symbols.
2. Evaluate numbers with exponents.
3. Multiply and divide from left to right.
4. Add and subtract from left to right.

Simplify $4^2 \div 2 + 3(9 - 5)$.

$$4^2 \div 2 + 3(9 - 5) = 4^2 \div 2 + 3 \cdot 4$$
$$= 16 \div 2 + 3 \cdot 4$$
$$= 8 + 12$$
$$= 20$$

Order of Operations

Skill Examples

1. $18 \div 2 - 4 = 9 - 4 = 5$

2. $2^2 \cdot (6 - 2) = 2^2 \cdot 4 = 4 \cdot 4 = 16$

3. $24 \div 2^3 - 1 = 24 \div 8 - 1 = 3 - 1 = 2$

4. $20 \div 10 + 21 \cdot 5 = 2 + 105 = 107$

5. $(2 + 3)^2 - 5 = 5^2 - 5 = 25 - 5 = 20$

Application Example

6. At a museum, 4 adults pay $15 each and 6 children pay $8 each. What is the total cost of the tickets?

$$4 \cdot 15 + 6 \cdot 8 = 60 + 48$$
$$= 108$$

The total cost is $108.

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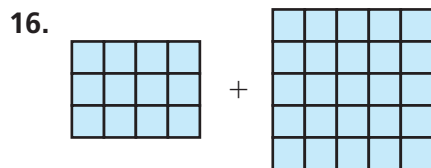*Check your answers at BigIdeasMath.com.*

Evaluate the expression.

7. $3^2 + 5(4 - 2) = \underline{19}$

8. $3 + 4 \div 2 = \underline{5}$

9. $10 \div 5 \cdot 3 = \underline{6}$

10. $4(3^3 - 8) \div 2 = \underline{38}$

11. $3 + 6^2 \div 2 = \underline{21}$
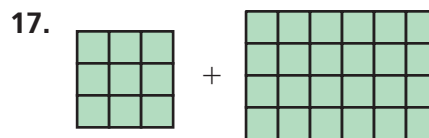
12. $12 + 7 \cdot 3 - 24 = \underline{9}$

Insert parentheses to make the statement true.

13. $(5^2 - 15) \div 5 = 2$

14. $12 \cdot (2^3 + 4) = 144$

15. $(91 - 21) \div 7 = 10$

Write an expression for the total area of the two rectangles. Evaluate your expression.

16.

$3 \cdot 4 + 5^2; 37$

17.

$3^2 + 4 \cdot 6; 33$

18. **ADMISSION** At a baseball game, 6 adults pay $20 each and 4 children pay $10 each. What is the total cost of the tickets? $\underline{\$160}$

19. **INSERTING PARENTHESES** Insert parentheses in the expression $4 + 2^3 - 5 \cdot 2$ in two ways: (a) so that the value is 10 and (b) so that the value is 14.

(a) $\underline{4 + (2^3 - 5) \cdot 2}$

(b) $\underline{(4 + 2^3 - 5) \cdot 2}$