

Algebra: Number Properties

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Name: _____

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Directions

Answer each item below. For items that ask you to identify a property, write the full name of the property (for example, "Commutative Property of Addition"). Show your work where space allows.

1. Identify the property shown:

$$(3 + 5) + 7 = 3 + (5 + 7)$$

Answer: _____

2. Identify the property shown:

$$4 \times 9 = 9 \times 4$$

Answer: _____

3. Use the Distributive Property to expand:

$$6(x + 4)$$

Answer: _____

4. Fill in the blank using the Identity Property:

$$12 + \underline{\quad} = 12$$

Answer: _____

5. Fill in the blank using the Inverse Property:

$$-8 + \underline{\quad} = 0$$

Answer: _____

6. What is the opposite of the number below?

$$-15$$

Answer: _____

7. Evaluate:

$$|-7| + |3|$$

Answer: _____

8. What is the reciprocal of the number below?

$$3/5$$

Answer: _____

9. Identify the property shown:

$$7(x + 2) = 7x + 14$$

Answer: _____

10. Use properties of numbers to simplify:

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

Answer: _____

Based on the Numberbender lesson "ALGEBRA: Number Properties" • youtu.be/xKtNiqVXtfc

Answer Key & Solutions

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Teacher Notes

Use the worked steps to discuss why each property holds. Items 1, 2, and 9 are property-identification; items 3 and 10 emphasize distribution and combining like terms; items 4 and 5 reinforce identity and inverse; items 6–8 review opposites, absolute value, and reciprocals.

1. Identify the property shown: $(3 + 5) + 7 = 3 + (5 + 7)$

Answer: Associative Property of Addition

The grouping (parentheses) of the addends changed, but the order stayed the same.

2. Identify the property shown: $4 \times 9 = 9 \times 4$

Answer: Commutative Property of Multiplication

The order of the factors was switched; the product is unchanged.

3. Use the Distributive Property to expand: $6(x + 4)$

Answer: $6x + 24$

Distribute 6 to each term inside: $6(x) + 6(4) = 6x + 24$.

4. Fill in the blank using the Identity Property: $12 + \underline{\hspace{1cm}} = 12$

Answer: 0 (the Additive Identity)

Adding 0 to any number leaves the number unchanged: $a + 0 = a$.

5. Fill in the blank using the Inverse Property: $-8 + \underline{\hspace{1cm}} = 0$

Answer: 8 (the Additive Inverse of -8)

A number plus its opposite equals 0: $-8 + 8 = 0$.

6. What is the opposite of the number below? -15

Answer: 15

The opposite of a number changes only its sign: $-(-15) = 15$.

7. Evaluate: $|-7| + |3|$

Answer: 10

$|-7| = 7$ and $|3| = 3$, so $|-7| + |3| = 7 + 3 = 10$.

8. What is the reciprocal of the number below? $3/5$

Answer: $5/3$

The reciprocal flips the numerator and denominator. Check: $(3/5) \times (5/3) = 1$.

9. Identify the property shown: $7(x + 2) = 7x + 14$

Answer: Distributive Property

The factor 7 was distributed to each term inside the parentheses: $7(x) + 7(2) = 7x + 14$.

10. Use properties of numbers to simplify: $2(x + 3) + 5x$

Answer: $7x + 6$

Step 1 (Distributive): $2(x + 3) + 5x = 2x + 6 + 5x$. Step 2 (Commutative / Associative): $2x + 5x + 6 = 7x + 6$.