

# Equivalent Expressions

Two expressions are equivalent if they have the same value when the variable is replaced with any number. For example, the following expressions are equivalent:

$$2 + 1 + 2x \quad 3 + 2x \quad 3 + x + x$$

Are the expressions  $4(x + 2)$  and  $2x + 5 + 2x + 3$  equivalent to  $4x + 8$ ?

You can apply the Distributive Property:  $4(x + 2) = 4x + 8$

The expressions  $4(x + 2)$  and  $4x + 8$  are equivalent.

You can apply the Commutative Property of Addition and combine like terms.

$$2x + 5 + 2x + 3 = 2x + 2x + 5 + 3 = 4x + 8$$

The expressions  $2x + 5 + 2x + 3$  and  $4x + 8$  are equivalent.

Identify the expressions that are equivalent to expression given.

1.  $2(x - 5)$

**A**  $2x - 8 - 2$

**B**  $2x - 8 + 2$

**C**  $2x - 5$

**D**  $2x - 10$

2.  $3(x - 3)$

**A**  $3x - 6$

**B**  $3x - 8 - 1$

**C**  $x + 2x - 3$

**D**  $x - 3 + x - 3 + x - 3$

3.  $8x + 10$

**A**  $2(4x + 10)$

**B**  $4x + 4x + 10$

**C**  $2(4x + 5)$

**D**  $10x + 8 + 2 - 2x$

4.  $7x + 6$

**A**  $6x + x + 6$

**B**  $6(x + 1) + x$

**C**  $4x + 2 + 3x + 4$

**D**  $7x + 8 - 2$

Determine if the expressions are equivalent. Substitute 3 for  $y$  to check.

5.  $5(y + 4)$  and  $2 + 5y + 18$

6.  $2y - 6$  and  $6y - 6 - 3y$

7. **Number Sense** Show that  $4x - 7$  is equivalent to  $4(x - 1) - 3$  when  $x = 3$ .

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