

For 1-25, name the property used by each statement.

1.  $9 \cdot 3 = 3 \cdot 9$

2.  $3 \cdot (4 \cdot 2) = (3 \cdot 4) \cdot 2$

3.  $234 \cdot 1 = 234$

Identity - Mult

4.  $56 \cdot 11 = 11 \cdot 56$

Commutative •

5.  $7,547,375 \cdot 0 = 0$

Zero Product

6.  $4 \cdot 8 \cdot 3 = 4 \cdot 3 \cdot 8$

Commutative •

7.  $5 + (7 + 2) = (5 + 7) + 2$

ASSOCIATIVE

8.  $5y(3 + k) = (3 + k)5y$

9.  $5y(3 + k) = 5y(k + 3)$

↑ ↑ Commutative +

10.  $5y(3 + k) = 5y(3) + 5y(k)$

11.  $235 + 0 = 235$

Identity Addition

12.  $4(509) = 4(500) + 4(9)$

13.  $-a + \underline{b^2}a + a = -a + \underline{ab^2} + a$

Commutative •

14.  $-2(4(lw) + 3) = -2((4l)w + 3)$

15.  $6 + \underline{2xyx} + 3 = 6 + \underline{x^2y} + 3$

Commutative

16.  $6(300 + 10) = 6(300) + 6(10)$

Distributive

17.  $3(100 - 3) = 3(100) - 3(3)$

18.  $x + (5 + 6) = x + 11$

Substitution

19.  $x = x$

reflexive

20. If  $10 + 3 = 13$ , then  $13 = 10 + 3$

21.  $357 - 10 = 357 - 10$

reflexive

22. If  $42 = y$ , then  $y = 42$

23. If  $20 + 5 = 25$  and  $25 = 5^2$  then  $20 + 5 = 5^2$

Transitive

24.  $5 \cdot \frac{1}{5} = 1$

25.  $(-4) + 4 = 0$

inverse +

For 26-33, rewrite the expression using the property given. DO NOT EVALUATE!

## 26. Commutative Property

- a.  $3 + 4 + 29 = 3 + 29 + 4$
- b.  $3xy + 2mk + m = 2mk + 3xy + m$
- c.  $3x(2 + y) = 3x(y + 2)$
- d.  $3xyz = yz3x$

## 27. Associative Property

- a.  $(x + y) + mk = x + (y + mk)$
- b.  $3xy + (2mk + m) = (3xy + 2mk) + m$
- c.  $(4m + 7) + k = 4m + (7 + k)$
- d.  $5x(8m \cdot 7) = (5x \cdot 8m) 7$

## 28. Multiplicative Inverse or Identity

- a.  $4x \cdot \quad = 1$
- b.  $\frac{2}{3} \cdot \quad = 1$
- c.  $\frac{1}{k} \cdot \quad = \frac{1}{k}$

## 33. Transitive Property

- a. If  $10 + 2 = 12$  and  $12 = 2(6)$  then  $10 + 2 = \underline{2(6)}$
- b. If  $x + 3 = y$  and  $y = z + 2$ , then  $x + 3 = \underline{\quad}$

## 29. Additive Inverse or identity

- a.  $-4x + \quad = 0$
- b.  $\quad + \quad = 3$
- c.  $\quad + \frac{2}{3} = 0$
- d.  $\quad + 5 = 5$

## 30. Symmetric Property

if  $x = 4$  then  $4 = x$

- a.  $x + y = \underline{\quad}$
- b.  $2x + y - 4z = \underline{\quad}$

## 31. Reflexive Property

- a.  $497 + 1,2345 = \underline{\quad}$
- b.  $7t - 9r = \underline{7t - 9r}$

## 32. Distributive Property

- a.  $5(x) + 5(4) = \underline{5(x+4)}$
- b.  $x(2 - y + t) = \underline{\quad}$