

Homework: Commutative and Associative Properties

Match the properties to the expressions. Name all that fit the property.

1. commutative property over addition: a, c, e.

2. commutative property over multiplication: g, h, j.

3. associative over addition d, i,

4. associative over multiplication b, f.

a. $2 + 6 + 8 = 2 + 8 + 6$

b. $4 \cdot (5 \cdot x) = (4 \cdot 5) \cdot x$

c. $(5 + 4) + 6 = (4 + 5) + 6$

d. $(5x + 4y) + 9m = 5x + (4y + 9m)$

e. $(6 + 2) + 8 = 8 + (6 + 2)$

f. $8 \cdot (3 \cdot 4) = (8 \cdot 3) \cdot 4$

g. $5 \cdot (4 \cdot 6) = 5 \cdot (6 \cdot 4)$

h. $(3x) + (cd) = (3x) + (dc)$

i. $(3 + 6) + 8 = 3 + (6 + 8)$

j. $5 \cdot 2 \cdot 6 = 5 \cdot 6 \cdot 2$

Review of all properties:

Simplify. Show steps and name the property used. (Some of these steps are usually done mentally.)

1. $3x + 5y + 8x + 2y$

$3x + 8x + 5y + 2y$ commutative (+)

$(3x + 8x) + (5y + 2y)$ associative (+)

$11x + 7y$ substitution

2. $5(3x + 4) + 6x$

$15x + 20 + 6x$ distributive

$15x + 6x + 20$ commutative (+)

$(15x + 6x) + 20$ associative

$21x + 20$ substitution

3. $2x + 3(5x + 4) + 3x$

$2x + 15x + 12 + 3x$ distributive

$2x + 15x + 3x + 12$ commutative(+)

$(2x + 15x + 3x) + 12$ associative (+)

$20x + 12$ substitution

4. $5 \cdot 0$

0 mult. prop. of zero

5. $\frac{1}{2} \cdot 2 \cdot 5$

$(\frac{1}{2} \cdot 2) \cdot 5$ associative (x)

$1 \cdot 5$ mult. inverse

5 mult. identity

6. $3(4x + 5) + 2(7x + 3)$

$12x + 15 + 14x + 6$ distributive

$12x + 14x + 15 + 6$ commutative (+)

$(12x + 14x) + (15 + 6)$ associative (+)

$26x + 21$ substitution

7. $15 - (3 \cdot 5)$

$15 - 15$ substitution

0 additive identity

8. $5 \cdot 13 \cdot 2$

$5 \cdot 2 \cdot 13$ commutative

$(5 \cdot 2) \cdot 13$ associative (x)

$10 \cdot 13$ substitution

130 substitution