

1. Fill in the missing parts.

a. The sum of $6c - 5$ and the opposite of $6c$

$$(6c - 5) + (-6c)$$

Rewrite subtraction as addition

$$6c + (-6c) + (-5)$$

$$0 + (-5)$$

Additive identity property of zero

b. The product of $-2c + 14$ and the multiplicative inverse of -2

$$(-2c + 14)\left(-\frac{1}{2}\right)$$

$$(-2c)\left(-\frac{1}{2}\right) + (14)\left(-\frac{1}{2}\right)$$

Multiplicative inverse, multiplication

$$1c - 7$$

Adding the additive inverse is the same as subtraction

$$c - 7$$

2. Write the sum and then rewrite the expression in standard form by removing parentheses and collecting like terms.

a. 6 and $p - 6$

b. $10w + 3$ and -3

c. $-x - 11$ and the opposite of -11

d. The opposite of $4x$ and $3 + 4x$

e. $2g$ and the opposite of $(1 - 2g)$

3. Write the product and then rewrite the expression in standard form by removing parentheses and collecting like terms.

a. $7h - 1$ and the multiplicative inverse of 7

b. The multiplicative inverse of -5 and $10v - 5$

c. $9 - b$ and the multiplicative inverse of 9

d. The multiplicative inverse of $\frac{1}{4}$ and $5t - \frac{1}{4}$

e. The multiplicative inverse of $-\frac{1}{10x}$ and $\frac{1}{10x} - \frac{1}{10}$

4. Write the expressions in standard form.

a. $\frac{1}{4}(4x + 8)$

b. $\frac{1}{6}(r - 6)$

c. $\frac{4}{5}(x + 1)$

d. $\frac{1}{8}(2x + 4)$

e. $\frac{3}{4}(5x - 1)$

f. $\frac{1}{5}(10x - 5) - 3$

1. Find the sum of $5x + 20$ and the opposite of 20. Write an equivalent expression in standard form. Justify each step.

$$(5x + 20) + (-20)$$

$$5x + (20 + (-20)) \quad \text{Associative property of addition}$$

$$5x + 0 \quad \text{Additive inverse}$$

$$5x \quad \text{Additive identity property of zero}$$

2. For $5x + 20$ and the multiplicative inverse of 5, write the product and then write the expression in standard form, if possible. Justify each step.

$$(5x + 20) \left(\frac{1}{5}\right)$$

$$(5x) \left(\frac{1}{5}\right) + 20 \left(\frac{1}{5}\right) \quad \text{Distributive property}$$

$$1x + 4 \quad \text{Multiplicative inverses, multiplication}$$

$$x + 4 \quad \text{Multiplicative identity property of one}$$

1. Fill in the missing parts.

- a. The sum of $6c - 5$ and the opposite of $6c$

$$(6c - 5) + (-6c)$$

$$\underline{(6c + (-5)) + (-6c)} \quad \text{Rewrite subtraction as addition}$$

$$6c + (-6c) + (-5) \quad \underline{\text{Regrouping/any order (or commutative property of addition)}}$$

$$0 + (-5) \quad \underline{\text{Additive inverse}}$$

$$\underline{-5} \quad \text{Additive identity property of zero}$$

- b. The product of $-2c + 14$ and the multiplicative inverse of -2

$$(-2c + 14) \left(-\frac{1}{2}\right)$$

$$(-2c) \left(-\frac{1}{2}\right) + (14) \left(-\frac{1}{2}\right) \quad \underline{\text{Distributive property}}$$

$$\underline{1c + (-7)} \quad \text{Multiplicative inverse, multiplication}$$

$$1c - 7 \quad \text{Adding the additive inverse is the same as subtraction}$$

$$c - 7 \quad \underline{\text{Multiplicative identity property of one}}$$

2. Write the sum and then rewrite the expression in standard form by removing parentheses and collecting like terms.

- a. 6 and $p - 6$

$$6 + (p - 6)$$

$$6 + (-6) + p$$

$$0 + p$$

$$p$$

b. $10w + 3$ and -3

$$(10w + 3) + (-3)$$

$$10w + (3 + (-3))$$

$$10w + 0$$

$$10w$$

c. $-x - 11$ and the opposite of -11

$$(-x + (-11)) + 11$$

$$-x + ((-11) + (11))$$

$$-x + 0$$

$$-x$$

d. The opposite of $4x$ and $3 + 4x$

$$(-4x) + (3 + 4x)$$

$$((-4x) + 4x) + 3$$

$$0 + 3$$

$$3$$

e. $2g$ and the opposite of $(1 - 2g)$

$$2g + (-(1 - 2g))$$

$$2g + (-1) + 2g$$

$$2g + 2g + (-1)$$

$$4g + (-1)$$

$$4g - 1$$

3. Write the product and then rewrite the expression in standard form by removing parentheses and collecting like terms.

a. $7h - 1$ and the multiplicative inverse of 7

$$(7h + (-1))\left(\frac{1}{7}\right)$$

$$\left(\frac{1}{7}\right)(7h) + \left(\frac{1}{7}\right)(-1)$$

$$h - \frac{1}{7}$$

b. The multiplicative inverse of -5 and $10v - 5$

$$\left(-\frac{1}{5}\right)(10v - 5)$$

$$\left(-\frac{1}{5}\right)(10v) + \left(-\frac{1}{5}\right)(-5)$$

$$-2v + 1$$

- c. $9 - b$ and the multiplicative inverse of 9

$$(9 + (-b))\left(\frac{1}{9}\right)$$

$$\left(\frac{1}{9}\right)(9) + \left(\frac{1}{9}\right)(-b)$$

$$1 - \frac{1}{9}b$$

- d. The multiplicative inverse of $\frac{1}{4}$ and $5t - \frac{1}{4}$

$$4\left(5t - \frac{1}{4}\right)$$

$$4(5t) + 4\left(-\frac{1}{4}\right)$$

$$20t - 1$$

- e. The multiplicative inverse of $-\frac{1}{10x}$ and $\frac{1}{10x} - \frac{1}{10}$

$$(-10x)\left(\frac{1}{10x} - \frac{1}{10}\right)$$

$$(-10x)\left(\frac{1}{10x}\right) + (-10x)\left(-\frac{1}{10}\right)$$

$$-1 + x$$

4. Write the expressions in standard form.

a. $\frac{1}{4}(4x + 8)$

$$\frac{1}{4}(4x) + \frac{1}{4}(8)$$

$$x + 2$$

b. $\frac{1}{6}(r - 6)$

$$\frac{1}{6}(r) + \frac{1}{6}(-6)$$

$$\frac{1}{6}r - 1$$

c. $\frac{4}{5}(x + 1)$

$$\frac{4}{5}(x) + \frac{4}{5}(1)$$

$$\frac{4}{5}x + \frac{4}{5}$$

d. $\frac{1}{8}(2x + 4)$

$$\frac{1}{8}(2x) + \frac{1}{8}(4)$$

$$\frac{1}{4}x + \frac{1}{2}$$

e. $\frac{3}{4}(5x - 1)$

$$\frac{3}{4}(5x) + \frac{3}{4}(-1)$$

$$\frac{15}{4}x - \frac{3}{4}$$

f. $\frac{1}{5}(10x - 5) - 3$

$$\frac{1}{5}(10x) + \frac{1}{5}(-5) + (-3)$$

$$2x + (-1) + (-3)$$

$$2x - 4$$