Use directed number with algebra

1 Complete the sentences.

a) Seven add six is equal to six add _____

$7 + 6 = 6 + \boxed{}$

b) Five multiplied by nine is equal to nine multiplied by _____

$5 \times 9 = 9 \times \boxed{}$

c) Negative ten add six is equal to six add _____

$-10 + 6 = 6 + \boxed{}$

d) Eight subtract three is equal to eight add _____

$8 - 3 = 8 + \boxed{}$

e) Three multiplied by negative two is equal to negative three

multiplied by _____

$3 \times -2 = -3 \times \boxed{}$

f) Negative four multiplied by negative five is equal to four

multiplied by _____

$-4 \times -5 = 4 \times \boxed{}$

2 Which expressions are not equivalent to $3f - 2g$?

$f + f + f - g - g$	$3f + -2g$	$f + f + f - g + g$
$-2g + 3f$	$f + f + f - (g + g)$	$2g - 3f$

3 Annie is finding the value of $4x - 7$ when $x = -3$

Here is Annie's method.

$$x = -3$$
$$\times 4 \qquad\qquad \times 4$$
$$4x = -12$$
$$-7 \qquad\qquad -7$$
$$4x - 7 = -19$$

Use Annie's method to evaluate the expressions for the given values.

a) $3k + 4$ when $k = -2$ **c)** $-t + 11$ when $t = -2$

b) $10g - 5$ when $g = -4$ **d)** $f^2 - 12$ when $f = -3$

4 Is this statement sometimes true, always true or never true?
Explain your answer.

$$y - x \text{ is less than } y.$$

Discuss with a partner and share examples.

5 Solve the equations.

a) $-5x = 20$ **d)** $2a + 10 = 4$

b) $6y = -15$ **e)** $h - 4 = -5$

c) $\dfrac{k}{7} = -3$ **f)** $-3x - 2 = -11$

6 Ron is working out the value of $7 - 5x$ when $x = -8$

He has made a mistake with his substitution.

$$-5 \times -8 = 40$$
$$40 - 7 = 33$$

What mistake has Ron made?

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Here is Annie's method.

$$\times 4 \quad \begin{array}{c} x = -3 \\ 4x = -12 \\ 4x - 7 = -19 \end{array} \quad \times 4$$
$$- 7 \qquad\qquad\qquad\qquad - 7$$

Use Annie's method to evaluate the expressions for the given values.

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b) $10g - 5$ when $g = -4$

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7 Find the missing terms.

a) $6t - 3t \equiv$ ____

b) $9k - 12k \equiv$ ____

c) $p - 8p + 2p \equiv$ ____

d) $-6x + 2x \equiv$ ____

e) $10n +$ ____ $\equiv 2n$

f) $3k -$ ____ $\equiv 8k$

8 Simplify the expressions.

a) $4d + 3 + -d + 1$

b) $-3t + h + 5 + 2t - 3 + 2h$

c) $2k - 3v + -3 + -2v + 1 - 2k + 3v$

9 Are the statements true or false?

When $x = -5$, $x^2 = -25$

When $y = -2$, $3y^2 = 36$

Discuss your answers with a partner.