

Chapter 1 TEST REVIEW

1. Find the value of each expression.

$$a. 4(12 - 4^2) = 4(12 - 16) = 4(-4) = \boxed{-16}$$

$$b. 12 - [20 - 2(6^2 \div 3 \times 2^2)]$$

$$= 12 - [20 - 2(36 \div 3 \times 4)]$$

$$= 12 - [20 - 2(12 \times 4)] = 12 - [20 - 2(48)] = 12 - [20 - 96]$$

$$= 12 - (-76)$$

$$= \boxed{88}$$

$$c. [4(5 - 3) - 2(4 - 8)] \div 16$$

$$= [4(2) - 2(-4)] \div 16$$

$$= [8 + 8] \div 16 = 16 \div 16 = \boxed{1}$$

$$d. \frac{-8(13-37)}{6} = \frac{-8(-24)}{6} = \frac{192}{6} = \boxed{32}$$

2. Evaluate each expression if $a = \frac{3}{4}$, $b = (-8)$, $c = (-2)$, $d=3$, and $e = \frac{1}{3}$.

$$a. ab^2 - d$$

$$\frac{3}{4}(-8)^2 - 3 = \frac{3}{4}(64) - 3 = 48 - 3 = \boxed{45}$$

$$b. \frac{d(b-c)}{ac}$$

$$\frac{3(-8 - (-2))}{\frac{3}{4}(-2)} = \frac{3(-6)}{-\frac{3}{2}} = \frac{-18}{-\frac{3}{2}} = -18 \div (-\frac{3}{2})$$

$$= 18 \cdot (-\frac{2}{3})$$

$$= \boxed{12}$$

$$c. -b[a + (c - d)^2]$$

$$-(-8) \left[\frac{3}{4} + (-2 - 3)^2 \right]$$

$$= 8 \left[\frac{3}{4} + (-5)^2 \right]$$

$$= 8 \left[\frac{3}{4} + 25 \right] = 8 \left[\frac{3}{4} + \frac{100}{4} \right] = 8 \left[\frac{103}{4} \right] = \boxed{206}$$

3. The formula $F = \frac{9}{5}C + 32$ gives the temperature in degrees Fahrenheit for a given temperature in degrees Celsius. What is the temperature in degrees Fahrenheit when the temperature is (-40) degrees Celsius?

$$F = \frac{9}{5}(-40) + 32$$

$$= -72 + 32 = \boxed{-40}$$

4. Name the sets of numbers to which each number belongs.

a. $\frac{6}{7}$ Real, Rational

b. 0 Real, Rational, Integer, Whole

c. $\frac{\sqrt{36}}{9} = \frac{6}{9} = \frac{2}{3}$ Real, Rational (MUST simplify first before categorizing)

d. 3 Real, Rational, Integer, Whole, Natural

5. Simplify each expression.

a. $8(3a - b) + 4(2b - a)$

$$24a - 8b + 8b - 4a = \boxed{20a}$$

b. $12\left(\frac{a}{3} - \frac{b}{4}\right) = \frac{12a}{3} - \frac{12b}{4} = \boxed{4a - 3b}$

c. $2.5m(12 - 8.5) = 2.5m(3.5) = \boxed{8.75m}$

6. Write an algebraic expression to represent each verbal expression.

- a. 2 more than the quotient of a number and 5

$$\frac{n}{5} + 2$$

- b. 1 less than twice the square of a number

$$2n^2 - 1$$

7. Solve each equation.

a. $14 = 8 - 6r$

$$\begin{array}{r} -8 \quad -8 \\ \hline 6 = -6r \\ \hline -6 \quad -6 \\ \hline -1 = r \end{array}$$

$$\boxed{-1 = r}$$

b. $-1.6b + 5 = -7.8$

$$\begin{array}{r} -5 \quad -5 \\ \hline -1.6b = -12.8 \end{array}$$

$$\begin{array}{r} -1.6b = -12.8 \\ \hline -1.6 \quad -1.6 \\ \hline b = 8 \end{array}$$

$$\boxed{b = 8}$$

c. $5(6 - 4w) = w + 21$

$$\begin{array}{r} 30 - 20w = w + 21 \\ +20w \quad +20w \\ \hline 30 = 21w + 21 \end{array}$$

$$\begin{array}{r} 30 = 21w + 21 \\ -21 \quad -21 \\ \hline 9 = 21w \end{array}$$

$$\frac{9}{21} = w$$

$$\boxed{\frac{3}{7} = w}$$

d. $6y - 5 = -3(2y + 1)$

$$\begin{array}{r} 6y - 5 = -6y - 3 \\ +6y \quad +6y \\ \hline 12y - 5 = -3 \end{array}$$

$$\begin{array}{r} 12y - 5 = -3 \\ +5 \quad +5 \\ \hline 12y = 2 \end{array}$$

$$\frac{12y}{12} = \frac{2}{12}$$

$$\boxed{y = \frac{1}{6}}$$

8. Solve each equation or formula for the specified variable.

a. $E = mc^2$ for m

$$\frac{E}{c^2} = \frac{mc^2}{c^2}$$

$$\boxed{\frac{E}{c^2} = m}$$

b. $c = \frac{2d+1}{3}$ for d

$$\begin{array}{r} 3c = 2d + 1 \\ -1 \quad -1 \\ \hline 3c - 1 = 2d \end{array}$$

$$\frac{3c - 1}{2} = \frac{2d}{2}$$

$$\boxed{\frac{3c - 1}{2} = d}$$

c. $h = vt - gt^2$ for v

$$\begin{array}{r} +gt^2 \quad +gt^2 \\ \hline h + gt^2 = vt \\ \hline \frac{h + gt^2}{t} = \frac{vt}{t} \end{array}$$

$$\boxed{\frac{h + gt^2}{t} = v}$$

9. Evaluate each expression if $a = (-1)$, $b = (-8)$, $c = 5$, and $d = (-1.4)$.

a. $-6|10a - 12|$

$$\begin{aligned} -6|10(-1) - 12| &= -6|-10 - 12| \\ &= -6|-22| = -6(22) = \boxed{-132} \end{aligned}$$

b. $|2b - 1| - |-8b + 5|$

$$\begin{aligned} |2(-8) - 1| - |-8(-8) + 5| \\ | -16 - 1 | - | 64 + 5 | \end{aligned}$$

$$|-17| - |69| = 17 - 69 = \boxed{-52}$$

10. Solve each equation. Check your solutions.

a. $|n - 4| = 13$

Case 1

$$\begin{array}{r} n - 4 = 13 \\ +4 \quad +4 \\ \hline n = 17 \end{array}$$

Check:
 $|17 - 4| = 13$
 $13 = 13$

Case 2

$$\begin{array}{r} n - 4 = -13 \\ +4 \quad +4 \\ \hline n = -9 \end{array}$$

Check:
 $|-9 - 4| = 13$
 $13 = 13$
 ✓

$\{-9, 17\}$

b. $-3|4x - 9| = 24$

$$\frac{-3}{-3} = \frac{24}{-3}$$

$|4x - 9| = -8$

no solution

c. $5 - 3|2 + 2w| = -7$

$$\begin{array}{r} -5 \quad -5 \\ \hline -3|2 + 2w| = -12 \\ \hline -3 \quad -3 \end{array}$$

$\{1, -3\}$

$|2 + 2w| = 4$

Case 1:

$$\begin{array}{r} 2 + 2w = 4 \\ -2 \quad -2 \\ \hline 2w = 2 \end{array}$$

$w = 1$

Check:

$$\begin{array}{l} 5 - 3|2 + 2(1)| = -7 \\ 5 - 3|4| = -7 \\ 5 - 12 = -7 \\ -7 = -7 \text{ true} \end{array}$$

Case 2:

$$\begin{array}{r} 2 + 2w = -4 \\ -2 \quad -2 \\ \hline 2w = -6 \end{array}$$

$w = -3$

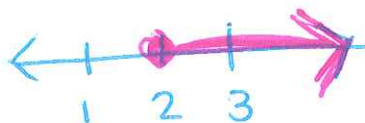
Check:

$$\begin{array}{l} 5 - 3|2 + 2(-3)| = -7 \\ 5 - 3|-4| = -7 \\ 5 - 12 = -7 \\ -7 = -7 \text{ true} \end{array}$$

11. Solve each inequality. Graph your solution on a number line.

a. $8x - 6 \geq 10$

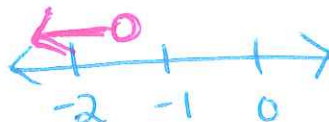
$$\begin{array}{r} +6 \quad +6 \\ \hline 8x \geq 16 \\ \hline x \geq 2 \end{array}$$



b. $-3(4w - 1) > 18$

$$\begin{array}{r} -12w + 3 > 18 \\ -3 \quad -3 \\ \hline -12w > 15 \\ \hline -12 \quad -12 \end{array}$$

$w < -1\frac{1}{4}$



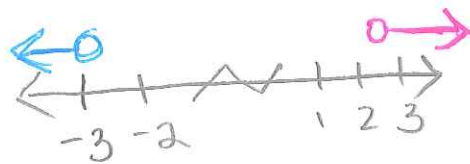
c. $-10 < 3x + 2 \leq 14$

$$\begin{array}{r} -2 \quad -2 \quad -2 \\ \hline -12 < 3x \leq 12 \\ \hline \frac{-12}{3} < \frac{3x}{3} \leq \frac{12}{3} \\ \hline -4 < x \leq 4 \end{array}$$



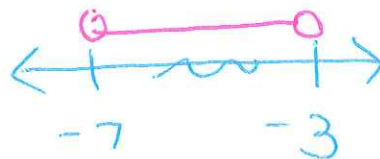
d. $5k + 2 < -13$ or $8k - 1 > 19$

$$\begin{array}{r} -2 \quad -2 \\ \hline 5k < -15 \\ \hline k < -3 \end{array} \quad \begin{array}{r} +1 \quad +1 \\ \hline 8k > 20 \\ \hline k > 2\frac{1}{2} \end{array}$$



e. $|y + 5| < 2$ "AND"

$$\begin{array}{r} -2 < y + 5 < 2 \\ -5 \quad -5 \quad -5 \\ \hline -7 < y < -3 \end{array}$$



f. $|x - 8| \geq 3$ "OR"

$$\begin{array}{r} x - 8 \geq 3 \\ +8 \quad +8 \\ \hline x \geq 12 \end{array}$$

$$\begin{array}{r} x - 8 \leq -3 \\ +8 \quad +8 \\ \hline x \leq 5 \end{array}$$

