

Simplifying Expressions

1. Evaluate each expression for $x = -3$ and $y = -8$ and circle your simplified expressions.

a. $4x - y + 10$
 $4(-3) - (-8) + 10$
 $-12 + 8 + 10$
 $-4 + 10 = \boxed{6}$

b. $6 - x|x + y|$
 $6 - (-3)|-3 + (-8)|$
 $6 + 3|-11|$
 $6 + 3(11)$
 $6 + 33 = \boxed{39}$

c. $2\sqrt{-3x} - y$
 $2\sqrt{-3(-3)} - (-8)$
 $2\sqrt{9} + 8$
 $2(3) + 8$
 $6 + 8 = \boxed{14}$

d. $3y(x + y^2 - x)$
 $3(-8)(-3 + (-8)^2 - (-3))$
 $3(-8)(-3 + 64 + 3)$
 $3(-8)(64) = \boxed{-1536}$

2. Simplify each of the following exponent expressions and circle your simplified expressions.

a. $\frac{4x^8}{12x^3}$
 $\frac{x^5}{3}$ or $\frac{1}{3}x^5$

b. $-4x^2 \cdot (2x)^{-3}$
 $\frac{-4x^2}{(2x)^3} = \frac{-4x^2}{8x^3}$
 $-\frac{1}{2x}$

c. $(-x^5)^2$
 x^{10}

d. $(\frac{3ab^3}{b^4})^2$
 $\frac{9a^2b^6}{b^8} = \frac{9a^2}{b^2}$

f. $(2x)^3$
 $8x^3$

g. $\frac{8x^2}{6x^5}$
 $\frac{4}{3x^3}$

h. $(-3x^5)^4 \cdot -2x^5y^{10}$
 $81x^{20} \cdot -2x^5y^{10}$
 $-162x^{25}y^{10}$

i. $(\frac{2x^{-4}}{x^5})^{-3}$
 $(\frac{x^5}{2x^{-4}})^3 = \frac{x^{15}}{8x^{-12}}$
 $\frac{x^{27}}{8}$

j. $\frac{b^6}{b^2}$
 b^4

k. $2x^2 \cdot (5x^3)^2$
 $2x^2 \cdot 25x^6$
 $50x^8$

l. $(-2b)^2$
 $4b^2$

m. $(\frac{a^4}{b^2})^2$
 $\frac{a^8}{b^4}$

n. $2x^8y \cdot 3x^3y^0$
 $6x^{11}y$

o. $5x^{-5}x^4$
 $\frac{5x^4}{x^5} = \frac{5}{x}$

p. $(-4a^3b^4)^2$
 $16a^6b^8$

q. $\frac{(2x)^3y^3}{8x^2y^8}$
 $\frac{8x^3y^3}{8x^2y^8}$
 $\frac{x}{y^5}$

Solving Equations

1. $|2x - 4| = 10$

$$\begin{array}{l} 2x - 4 = 10 \\ 2x = 14 \\ \boxed{x = 7} \end{array} \quad \begin{array}{l} 2x - 4 = -10 \\ 2x = -6 \\ \boxed{x = -3} \end{array}$$

3. $2|x + 3| - 5 = 7$

$$\begin{array}{l} +5 +5 \\ \hline 2|x + 3| = 12 \\ \frac{2}{2} \\ |x + 3| = 6 \\ \begin{array}{l} x + 3 = 6 \\ \boxed{x = 3} \end{array} \quad \begin{array}{l} x + 3 = -6 \\ \boxed{x = -9} \end{array} \end{array}$$

5. $3 + 2|x - 3| = 13$

$$\begin{array}{l} -3 -3 \\ \hline 2|x - 3| = 10 \\ \frac{2}{2} \\ |x - 3| = 5 \\ \begin{array}{l} x - 3 = 5 \\ \boxed{x = 8} \end{array} \quad \begin{array}{l} x - 3 = -5 \\ \boxed{x = -2} \end{array} \end{array}$$

7. $|2x + 6| - 10 = -3$

$$\begin{array}{l} +10 +10 \\ \hline |2x + 6| = 7 \\ \begin{array}{l} 2x + 6 = 7 \\ 2x = 1 \\ \boxed{x = 1/2} \end{array} \quad \begin{array}{l} 2x + 6 = -7 \\ 2x = -13 \\ \boxed{x = -6 1/2} \end{array} \end{array}$$

2. $3|x - 1| + 2 = 11$

$$\begin{array}{l} -2 -2 \\ \hline 3|x - 1| = 9 \\ \frac{3}{3} \\ |x - 1| = 3 \\ \begin{array}{l} x - 1 = 3 \\ \boxed{x = 4} \end{array} \quad \begin{array}{l} x - 1 = -3 \\ \boxed{x = -2} \end{array} \end{array}$$

4. $|4 - 2y| + 5 = 9$

$$\begin{array}{l} -5 -5 \\ \hline |4 - 2y| = 4 \\ \begin{array}{l} 4 - 2y = 4 \\ -2y = 0 \\ \boxed{y = 0} \end{array} \quad \begin{array}{l} 4 - 2y = -4 \\ -2y = -8 \\ \boxed{y = 4} \end{array} \end{array}$$

6. $-3 - 2|x + 1| = -3$

$$\begin{array}{l} +3 +3 \\ \hline -2|x + 1| = 0 \\ \frac{-2}{-2} \\ |x + 1| = 0 \\ \boxed{x = -1} \end{array}$$

7. Solve each of the following formulas for the requested variable.

a. $4 + y = 2x + 20$ solve for x

$$\begin{array}{l} -20 -20 \\ \hline -16 + y = 2x \\ \frac{-16 + y}{2} = \frac{2x}{2} \\ \boxed{1/2y - 8 = x} \end{array}$$

b. $A = \frac{1}{2}bh$ solve for h

$$\begin{array}{l} \frac{1}{2}ab \\ \hline \boxed{h = \frac{A}{1/2ab} = \frac{2A}{b}} \end{array}$$

c. $ax^2 + bx + c = 0$ solve for b

$$\begin{array}{l} -ax^2 -c \\ \hline bx = -ax^2 - c \\ \frac{bx}{x} = \frac{-ax^2 - c}{x} \\ \boxed{b = \frac{-ax^2 - c}{x} = -ax - c/x} \end{array}$$

d. $4x + 2y = 6$ Solve for y

$$\begin{array}{l} -4x -4x \\ \hline 2y = -4x + 6 \\ \boxed{y = -2x + 3} \end{array}$$

e. $-5x + 4y = 10$ Solve for x

$$\begin{array}{l} -4y -4y \\ \hline -5x = -4y + 10 \\ \boxed{x = 4/5y - 2} \end{array}$$

f. $x = y + (n - 1)d$ Solve for n

$$\begin{array}{l} -y -y \\ \hline x - y = (n - 1)d \\ \frac{x - y}{d} = \frac{(n - 1)d}{d} \\ \frac{x - y}{d} = n - 1 \\ +1 +1 \\ \hline \boxed{n = 1 + \frac{x - y}{d}} \end{array}$$