

Unit 2: Equations – Review

Solve for the unknown.

$$\begin{array}{r} 8 + m = -2 \\ -8 \quad -8 \\ \hline m = -10 \end{array}$$

$$\begin{array}{r} 3x = 18 \\ \div 3 \quad \div 3 \\ \hline x = 6 \end{array}$$

$$\begin{array}{r} -3s - 6 = 9 \\ +6 \quad +6 \\ \hline -3s = 15 \\ \div -3 \quad \div -3 \\ \hline s = -5 \end{array}$$

$$\begin{array}{r} k - 7 = -11 \\ +7 \quad +7 \\ \hline k = -4 \end{array}$$

$$\begin{array}{r} 5 \cdot \frac{h}{5} = -4 \cdot 5 \\ \hline h = -20 \end{array}$$

$$\begin{array}{r} -7y - 6 = -20 \\ +6 \quad +6 \\ \hline -7y = -14 \\ \div -7 \quad \div -7 \\ \hline y = 2 \end{array}$$

Solve for the unknown.

$$\begin{array}{r} 3 + 2m + 6m = 19 \\ \hline 3 + 8m = 19 \\ -3 \quad -3 \\ \hline 8m = 16 \\ \div 8 \quad \div 8 \\ \hline m = 2 \end{array}$$

$$\begin{array}{r} 3x + 7 = 2x - 3 \\ -2x \quad -2x \\ \hline x + 7 = -3 \\ -7 \quad -7 \\ \hline x = -10 \end{array}$$

$$\begin{array}{r} 7 + 3k - 2 = 4k \\ \hline 5 + 3k = 4k \\ -3k \quad -3k \\ \hline 5 = k \\ \hline k = 5 \end{array}$$

like terms

check:
 $5 + 3k = 4k$
 $5 + 3(5) = 4(5)$
 $5 + 15 = 20$
 $20 = 20$
 $k = 5$

$$\begin{array}{r} 4 - (3p - 2) = p - 10 \\ \hline 4 - 3p + 2 = p - 10 \\ \hline 6 - 3p = p - 10 \\ -p \quad -p \\ \hline 6 - 4p = -10 \\ +6 \quad +6 \\ \hline -4p = -16 \\ \div -4 \quad \div -4 \\ \hline p = 4 \end{array}$$

$$\begin{array}{r} 3(2k - 5) - k = 4 - (3k + 7) \\ \hline 6k - 15 - k = 4 - 3k - 7 \\ \hline 5k - 15 = -3 - 3k \\ +3k \quad +3k \\ \hline 8k - 15 = -3 \\ +15 \quad +15 \\ \hline 8k = 12 \\ \div 8 \quad \div 8 \\ \hline k = \frac{3}{2} \end{array}$$

$$\begin{array}{r} 2(n - 8) = -4(2n - 1) \\ \hline 2n - 16 = -8n + 4 \\ +8n \quad +8n \\ \hline 10n - 16 = 4 \\ +16 \quad +16 \\ \hline 10n = 20 \\ \div 10 \quad \div 10 \\ \hline n = 2 \end{array}$$

Solve for the unknown.

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

$$\cancel{1} \cdot \frac{(x-1)}{3} = 4 \cdot \cancel{3} \quad \text{*rewrite using Maddy's method}$$

$$x - \cancel{1} = 12$$

$$\boxed{x = 13}$$

$$\cancel{3} \cdot \frac{(b-4)}{3} = -5 \cdot \cancel{3} \quad \text{bracket the top}$$

$$b - \cancel{4} = -15$$

$$\boxed{b = -11}$$

$$3 = \frac{3}{4}(p-1)$$

$$4 \cdot 3 = \frac{3(p-1)}{\cancel{4}} \cdot \cancel{4} \quad \text{rewrite}$$

$$12 = 3(p-1)$$

$$12 = 3p - 3$$

$$3p = 15$$

$$\boxed{p = 5}$$

$$\frac{12}{3} = \frac{3(p-1)}{\cancel{3}}$$

$$4 = p - 1$$

$$\boxed{p = 5}$$

$$7 \cdot -3 = \frac{(5x+4)}{7} \cdot \cancel{7}$$

$$-21 = (5x + \cancel{4})$$

$$\frac{-25}{5} = \frac{5x}{5}$$

$$\boxed{x = -5}$$

Solve for the unknown.

$$\cancel{3} \cdot \frac{(y-8)}{3} = \frac{3(y+4)}{2}$$

$$\cancel{2} \cdot \frac{(y-8)}{\cancel{2}} = \frac{3(y+4)}{\cancel{2}}$$

$$2(y-8) = 3(y+4)$$

$$2y - 16 = 3y + 12$$

$$-y - 16 = 12$$

$$-y = 28$$

$$\boxed{y = -28}$$

$$\frac{2}{5}(x+3) = \frac{1}{2}(x-5)$$

$$\cancel{2} \cdot \frac{2(x+3)}{\cancel{2}} = \frac{\cancel{5} \cdot (x-5)}{\cancel{2}}$$

$$4(x+3) = 5(x-5)$$

$$4x + 12 = 5x - 25$$

$$-x + 12 = -25$$

$$-x = -37$$

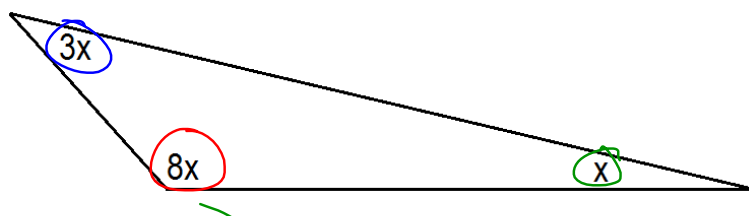
$$\boxed{x = 37}$$

Rearrange each formula to isolate the variable indicated.

$P = \boxed{a} + b + c$ for a $-b - c$ $\boxed{a = P - b - c}$	$\frac{g}{3} = \cancel{3}h$ for h $h = \frac{g}{3}$ $\boxed{h = \frac{1}{3}g}$	$\cancel{t} \cdot a = \frac{v}{\cancel{t}}$ for t $\frac{t}{a} = \frac{v}{a}$ $\boxed{t = \frac{v}{a}}$
$d = \boxed{mt} + b$ for t $-b$ $\frac{d-b}{m} = \frac{mt}{m}$ $\boxed{t = \frac{d-b}{m}}$	$d = \boxed{mt} + b$ for b $-mt$ $\boxed{b = d - mt}$	$X = \frac{5Y\cancel{Z^2}}{\cancel{5Y}}$ for Z $\sqrt{Z^2} = \sqrt{\frac{X}{5Y}}$ $\boxed{Z = \sqrt{\frac{X}{5Y}}}$

A triangle has angle measures that are related as follows:

- The largest angle is eight times the smallest angle
- The middle angle is triple the smallest angle



Find the measure of each angle.

Hint: The sum of the angles in a triangle is 180 degrees.

$$5x + 3x + x = 180$$

$$\frac{12x}{12} = \frac{180}{12}$$

$$\boxed{x = 15}$$

Smallest $\rightarrow 15^\circ$
 middle $\rightarrow 45^\circ$
 largest $\rightarrow 120^\circ$

Think of an algebraic expression to represent each description:

a) Triple a number

$$3n$$

b) Four more than a number

$$n + 4$$

c) Heather is 5 years older than Megan

$$\boxed{M = H - 5} \text{ or } \boxed{H = M + 5}$$

d) Sarah makes five less than double Emma's salary.

$$S = 2E - 5$$

The sum of three consecutive integers is 54.

What are the integers?

Let x represent the smallest integer,
then $x+1$ is the middle integer
and $x+2$ is the largest integer.

$$x + (x+1) + (x+2) = 54$$

$$3x + 3 = 54$$

$$3x + 3 = 54$$

$$\begin{array}{r} -3 \quad -3 \\ \hline 3x = 51 \end{array}$$

$$\frac{3x = 51}{3} \quad \frac{3}{3}$$

$$x = 17$$

\therefore the numbers are
17, 18, 19

Jamie earns \$150 more per week than Johnny and \$100 less than Jackson. Together the three earn \$2050 per week. How much does each person earn per week?

Let M represent Jamie's salary

then $M-150$ is Johnny

and $M+100$ is Jackson

$$M + (M-150) + (M+100) = 2050$$

$$3M - 50 = 2050$$

$$\begin{array}{r} +50 \quad +50 \\ \hline 3M = 2100 \end{array}$$

$$\frac{3M = 2100}{3} \quad \frac{3}{3}$$

$$M = 700$$

\therefore Jamie earns \$700,
Johnny earns \$550
and Jackson earns \$800.

Shawn works at a cell phone kiosk. He earns \$8.50 per hour plus a \$15 commission for each contract he sells.

a) Write an expression to represent Shawn's earnings.

b) How much will Shawn make in an 8-hr shift if he sells seven contracts?

c) How many contracts does Shawn need to sell to earn \$790 in a 40-hr work week?

$$a) E = 8.50h + 15c$$

$$b) E = 8.50(8) + 15(7)$$

$$= 68 + 105$$

$$= 173$$

\therefore Shawn makes \$173

$$c) E = 8.50h + 15c$$

$$\downarrow$$

$$790 = 8.50(40) + 15c$$

$$790 = 340 + 15c$$

$$\begin{array}{r} -340 \quad -340 \\ \hline 450 = 15c \end{array}$$

$$\frac{450 = 15c}{15} \quad \frac{15}{15}$$

$$c = 30$$

\therefore We must sell 30 contracts