

Section 2.1-2.4 (Solving Equations): Solve each equation.

$$1. \left[\frac{1}{7}(x+2) \right] = \left[\frac{3}{7} \right] - 1$$

$$x+2 = 3$$

$$\begin{array}{r} -2 \\ -2 \end{array}$$

$$x = 1$$

$$2. -(3w+4) = 6w - 3(3w+2)$$

$$-3w - 4 = 6w - 9w - 6$$

$$-3w - 4 = -3w - 6$$

$$\begin{array}{r} +3w \\ +3w \end{array}$$

$$-4 \neq -6$$

No Solution: \emptyset

$$3. \left(\frac{x}{-3} \right) = (6)(-3)$$

$$x = -18$$

$$4. -2(1-8y) - 1 = -3 + 16y$$

$$-2 + 16y - 1 = -3 + 16y$$

$$16y - 3 = -3 + 16y$$

$$\begin{array}{r} -16y \\ -16y \end{array}$$

$$-3 = -3$$

Infinite Solutions: \mathbb{R}

$$5. 4f - 8 = 20$$

$$\begin{array}{r} +8 \\ +8 \end{array}$$

$$4f = 28$$

$$\begin{array}{r} /4 \\ /4 \end{array}$$

$$f = 7$$

$$6. k + 10 - 4k = -11$$

$$10 - 3k = -11$$

$$\begin{array}{r} -10 \\ -10 \end{array}$$

$$-3k = -21$$

$$\begin{array}{r} /-3 \\ /-3 \end{array}$$

$$k = 7$$

Section 1.2 (Order of Operations): Simplify each expression.

$$7. \left(\frac{5(2)(4)}{30-5(5)} \right)^2$$

$$= \left(\frac{40}{30-25} \right)^2$$

$$= \left(\frac{40}{5} \right)^2$$

$$= 8^2$$

$$= 64$$

$$8. 5 - 3x + 6(x + 2y)$$

$$= 5 - 3x + 6x + 12y$$

$$= 5 + 3x + 12y$$

$$9. 5[(4+8) - 3^3]$$

$$= 5[12 - 27]$$

$$= 5(-15)$$

$$= -75$$

Section 2.5 (Solving Literal Equations): Solve for the given variable.

$$10. x(n) = \left(\frac{p-k}{x} \right)^x \text{ for } p$$

$$xn = p - k$$

$$\begin{array}{r} +k \\ +k \end{array}$$

$$xn + k = p$$

$$11. 3ab - 2bc = 12 \text{ for } c$$

$$\begin{array}{r} -3ab \\ -3ab \end{array}$$

$$-2bc = 12 - 3ab$$

$$\begin{array}{r} -2b \\ -2b \end{array}$$

$$c = \frac{12 - 3ab}{-2b}$$

or

$$c = -\frac{6}{b} + \frac{3a}{2}$$

$$12. \frac{xw}{x} = \frac{h}{x} \text{ for } w$$

$$w = \frac{h}{x}$$

Section 2.5 (Solving Literal Equations) Continued: Solve for the given variable.

13. $y + m = c$ for m
 $-y$ $-y$
 $\underline{m = c - y}$

14. $(A) = \left(\frac{1}{2}bh\right)^2$ for h
 $\frac{2A}{b} = \frac{bh}{b}$
 $\underline{\frac{2A}{b} = h}$

15. $P = 2l + 2w$ for w
 $-2l$ $-2l$
 $\frac{P - 2l}{2} = \frac{2w}{2}$
 $w = \frac{P - 2l}{2}$
 or
 $w = \frac{P}{2} - l$

Section 2.7 (Solving Proportions): Solve the following proportions.

16. $\frac{3}{2} = \frac{w}{6} \Rightarrow \frac{18}{2} = \frac{2w}{2}$
 $\underline{9 = w}$

17. $\frac{-3}{4} = \frac{y}{16} \Rightarrow \frac{-48}{4} = \frac{4y}{4}$
 $\underline{-12 = y}$

18. $\frac{x+4}{-6} = \frac{8}{2}$
 $\frac{2(x+4)}{2} = \frac{-48}{2}$
 $x+4 = -24$
 -4 -4
 $\underline{x = -28}$

19. $\frac{3}{y+1} = \frac{4}{y+4}$
 $3(y+4) = 4(y+1)$
 $3y+12 = 4y+4$
 $-3y$ $-3y$
 $12 = y+4$
 -4 -4
 $\underline{8 = y}$

20. $\frac{10}{4} = \frac{w-8}{16}$
 $\frac{160}{4} = \frac{4(w-8)}{4}$
 $40 = w-8$
 $+8$ $+8$
 $\underline{48 = w}$

21. $\frac{6}{7} = \frac{y-2}{y+1}$
 $6(y+1) = 7(y-2)$
 $6y+6 = 7y-14$
 $-6y$ $-6y$
 $6 = y-14$
 $+14$ $+14$
 $\underline{20 = y}$

Section 2.4 (Rates, Ratios, and Conversions):

22. Find the unit rate and which product is the better deal.

a.) Verizon charges \$74.00 for 500 minutes and Sprint charges \$54.00 for 450 minutes. Which is the better deal and why?

$\frac{\$74}{500} = \0.148 per min

$\frac{\$54}{450} = \0.12 per min

Verizon: \$0.148 per min Sprint: \$0.12 per min Better deal and Why: Sprint;
\$0.12 per min is cheaper than \$0.148 per min. with Verizon

b.) Kwik Trip has 21 gallons for gas for \$70.50 and Holiday has 15 gallons for \$50.25. Which is the better deal and why?

$$\frac{\$70.50}{21} = \$3.36$$

$$\frac{\$50.25}{15} = \$3.35$$

Kwik Trip: \$3.36 per gallon Holiday: \$3.35 per gallon Better deal and Why: Holiday;
\$3.35 per gallon is cheaper than \$3.36 per gallon @ Kwik Trip.

23. Convert the given amount to the given unit.

a.) 15 days; 360 hours

$$15 \text{ days} \times \frac{24 \text{ hour}}{1 \text{ day}} = \underline{360 \text{ hrs}}$$

b.) 100 meters; 10,000 cm

$$100 \text{ m} \times \frac{100 \text{ cm}}{1 \text{ m}} = \underline{10,000 \text{ cm}}$$

c.) 60 mins; 3600 secs

$$60 \text{ min} \times \frac{60 \text{ sec}}{1 \text{ min}} = \underline{3600 \text{ sec}}$$

d.) 60 ft; 20 yards

$$60 \text{ ft} \times \frac{1 \text{ yd}}{3 \text{ ft}} = \underline{20 \text{ yd}}$$

e.) 3.5 days; 5,040 min

$$3.5 \text{ days} \times \frac{24 \text{ hr}}{1 \text{ day}} \times \frac{60 \text{ min}}{1 \text{ hr}} = \underline{5,040 \text{ mins}}$$

f.) 14 gal/sec; 3,360 qt/min

$$\frac{14 \text{ gal}}{1 \text{ sec}} \times \frac{4 \text{ qt}}{1 \text{ gallon}} \times \frac{60 \text{ sec}}{1 \text{ min}} = \underline{3,360 \text{ qt/min}}$$

g.) 4 feet per second into miles per week

$$\frac{4 \text{ ft}}{1 \text{ sec}} \times \frac{1 \text{ mi}}{5,280 \text{ ft}} \times \frac{60 \text{ sec}}{1 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{24 \text{ hr}}{1 \text{ day}} \times \frac{7 \text{ days}}{1 \text{ week}} = \frac{2419200}{5,280}$$

$$= \underline{458.18 \text{ miles per week}}$$

24. Solve using the problem solving plan. (Remember you can make tables to help)

a.) Chandra has twice as much money as Nora. Nora has \$6 less than Lyle. Together they have \$54. How much money does each have?

Chandra	$2(x-6)$	=	\$24
Nora	$x-6$	=	\$12

$$\text{Lyle} \quad x \quad = \quad \$18$$

$$2(x-6) + x-6 + x = 54$$

$$2x-12 + x-6 + x = 54$$

$$4x-18 = 54$$

$$+18 \quad +18$$

$$\frac{4x}{4} = \frac{72}{4}$$

$$x = \$18$$

b.) Four times a number, increased by 25, is 13 less than six times the number. Find the number.

$$\begin{aligned}
 4x + 25 &= 6x - 13 \\
 -6x &\quad -6x \\
 \hline
 -2x + 25 &= -13 \\
 -25 &\quad -25 \\
 \hline
 -2x &= -38 \\
 \frac{-2x}{-2} &= \frac{-38}{-2} \\
 x &= 19
 \end{aligned}$$

c.) I have twice as many nickels as quarters. If the coins are worth \$4.90, how many quarters are there?

Nickels	2x	0.05	0.10x
Quarters	x	0.25	0.25x

$$\begin{aligned}
 0.10x + 0.25x &= 4.90 \\
 0.35x &= 4.90 \\
 \frac{0.35x}{0.35} &= \frac{4.90}{0.35} \\
 x &= 14 \text{ quarters}
 \end{aligned}$$

d.) A helicopter leaves Central Airport and flies north at 180 mph. ^{2?} Thirty minutes later a plane leaves the airport and follows the helicopter at 330 mph. How long does it take the plane to overtake the helicopter?

	rate	x	time	= Distance
Helicopter	180		x	180x
Plane	330		x - 1/2	330(x - 1/2)

$$\begin{aligned}
 180x &= 330x - 165 \\
 -330x &\quad -330x \\
 \hline
 -150x &= -165 \\
 \frac{-150x}{-150} &= \frac{-165}{-150} \\
 x &= 1.1 \rightarrow 1 \text{ hour and } 6 \text{ mins}
 \end{aligned}$$