

# Key

## Algebra 1 Chapter 2 Practice Test

1.) (5 pts each) Solving One Step Equations (2-1) Solve each equation.

a)  $b + 8 = 21$   
 $-8 \quad -8$

$$b = 13$$

b)  $a - 11 = 54$   
 $+11 \quad +11$

$$a = 65$$

c)  $\frac{6a}{6} = \frac{72}{6}$

$$a = 12$$

d)  $\frac{y}{8} = 5$   
 $8\left(\frac{y}{8}\right) = (5)(8)$

$$y = 40$$

e)  $\frac{-15t}{-15} = \frac{45}{-15}$

$$t = -3$$

2.) (5 pts each) Solving Two-Step Equations (2-2) Solve each equation.

a)  $3x + 8 = 44$   
 $-8 -8$

$$\frac{3x}{3} = \frac{36}{3} \quad x = 12$$

b)  $\frac{b}{5} - 4 = -2$   
 $+4 +4$   
 $5\left(\frac{b}{5}\right) = (2)5$   
 $b = 10$

c)  $15 = 6x - 9$   
 $+9 +9$   
 $\frac{24}{6} = \frac{6x}{6}$   
 $x = 4$

d)  $8 = \frac{a}{7} + 12$   
 $-12 -12$   
 $(-7)(-4) = \left(\frac{a}{7}\right)(-7)$   
 $a = 28$

3.) (5 pts each) Solving Multi-Step Equations (2-3) Solve each equation.

a)  $8c + 7(2c - 3) = 23$

$$8c + 14c - 21 = 23$$

$$22c - 21 = 23$$
$$+21 +21$$

$$\frac{22c}{22} = \frac{44}{22}$$

$$\boxed{c = 2}$$

b)  $3(4 + x) - (2x + 3) = 14$

$$12 + 3x - 2x - 3 = 14$$

$$12 + (-3) = 9$$

$$\begin{array}{r} x + 9 \\ -9 \end{array} = \begin{array}{r} 14 \\ -9 \end{array}$$

$$x = 5$$

c)  $9y - 2(3y - 5) = 8$

$$9y - 6y + 10 = 8$$

$$\begin{array}{r} 3y + 10 \\ -10 \end{array} = \begin{array}{r} 8 \\ -10 \end{array}$$

$$\frac{3y}{3} = \frac{-2}{3}$$

$$y = \frac{-2}{3}$$

d)  $\frac{c+5}{2} = 11$

$$2\left(\frac{c+5}{2}\right) = (11)^2$$

$$c+5 = 22$$

$$\begin{array}{r} c+5 \\ -5 \end{array} = \begin{array}{r} 22 \\ -5 \end{array}$$

$$c = 17$$

4.) (5 pts each) Equations with Variables on Both Sides (2-4) Solve each equation.

a)  $6x - 25 = 7 - 2x$

$$\begin{array}{r} +25 +25 \\ 6x = 32 - 2x \end{array}$$

$$\begin{array}{r} +2x \\ 4x \end{array}$$

$$\frac{8x}{8} = \frac{32}{8}$$

$$x = 4$$

b)  $4(a - 2) = 7a - 35$

$$\begin{array}{r} 4a - 8 = 7a - 35 \\ -4a -4a \end{array}$$

$$\begin{array}{r} -8 = 3a - 35 \\ +35 +35 \end{array}$$

$$\frac{27}{3} = \frac{3a}{3} \quad a = 9$$

c)  $9b + 15 = 11b + 27$

$$\begin{array}{r} -9b -9b \end{array}$$

$$\begin{array}{r} 15 = 2b + 27 \\ -27 -27 \end{array}$$

$$\begin{array}{r} -12 = 2b \\ \frac{-12}{2} = \frac{2b}{2} \end{array}$$

$$b = -6$$

$$d) \overbrace{8(3y - 2)}^{\text{Distribute}} = \overbrace{4(5y + 4)}^{\text{Distribute}}$$

$$\begin{array}{rcl} 24y - 16 & = & 20y + 16 \\ -20y & & -20y \\ 4y - 16 & = & 16 \\ +16 & & +16 \end{array}$$

$$\frac{4y}{4} = \frac{32}{4}$$

$$y = 8$$

- 5.) (5 pts each) Equations and Problem Solving (2-5) Write and solve an equation for each situation.

- a) A man stole Nate's burrito and drove away at 50 mi/hr. Hangry, Nate took off on foot in the same direction a half an hour later. If Nate ran at 60 mi/hr, how long will it take for him to catch the nefarious burrito burglar?

$$\text{Relative rate: } 60 - 50 = 10$$

$$\text{Head start: } \frac{0.5}{\text{time}} \cdot (0.5)(50) = 25 \text{ mi}$$

$$\text{time to intercept} = \frac{\text{head start distance}}{\text{relative rate}} = \frac{25}{10} \boxed{2.5 \text{ hrs}}$$

$$50(\overbrace{t+0.5})^{\text{Distribute}} = 60t$$

$$50t + 25 = 60t$$

$$\frac{25}{10} = \frac{10t}{10}$$

$$\boxed{2.5 = t}$$

- b) A train leaves the station at 12pm traveling at 120 mi/hr. A second train left from ~~at the same time~~  
~~the same station at 2pm~~ traveling 80 mi/hr in the opposite direction. How long until the trains are 840 miles apart?

$$\text{Relative rate: }$$

Since they are going in opposite directions, we add the relative rates

$$\frac{120 \text{ mi/hr} + 80 \text{ mi/hr}}{200 \text{ mi/hr}}$$

$$\frac{840}{200} = \boxed{4.2 \text{ hrs}}$$

- c) Usain Bolt ran an iron man event at a respectable 12 mi/hr. Nate, feeling generous, gave him an hour head start. If Nate ran 18 mi/hr, how long until he caught up with Usain Bolt?

$$\text{Relative rate: } 18 - 12 = 6$$

$$\text{Head start: } \frac{1}{\text{time}} \cdot 1(12) = 12$$

$$12(\overbrace{t+1})^{\text{Distribute}} = 18t$$

$$12t + 12 = 18t$$

$$-12t \quad -12t$$

$$\frac{12}{6} = \frac{6t}{6}$$

$$\boxed{2 = t}$$

$$\frac{\text{head start distance}}{\text{relative rate}} = \frac{12}{6} = 2 \text{ hrs}$$