Name Answer Key Period _____

Original Score

Algebra – Unit 1 Extra Practice

I can solve equations with variables on one side.

1. $-7x - 3x - 85 = 125$ (Combine!)

$-10x - 85 = 125$

$+85 \quad +85$

$-10x = 210$

$\frac{-10x}{-10} = \frac{210}{-10}$

$x = -21$

$x = -21$

2. $5(2 - x) - 3(4 - 2x) = 20$

$10 - 5x - 12 + 6x = 20$ (Combine!)

$-2 + x = 20$

$+2 \quad +2$

$x = 22$

$x = 22$

3. $\frac{1}{2}(x - 3) + 7 = 12$

$-7 \quad -7$

$\frac{1}{2}(x-3) = 5 \cdot 2$ (Multiply by reciprocal!)

$x - 3 = 10$

$+3 \quad +3$

$x = 13$

$x = 13$

4. $4(x + 3) - 2x = 7$

$4x + 12 - 2x = 7$ (Combine!)

$2x + 12 = 7$

$-12 \quad -12$

$2x = -5$

$\frac{2x}{2} = \frac{-5}{2}$

$x = -2\frac{1}{2}$

5. $\frac{3x}{12} \times \frac{9}{2}$ (Cross multiply!)

$3x \cdot 2 = 9 \cdot 12$

$\frac{6x}{6} = \frac{108}{6}$

$x = 18$

$x = 18$

$6 \overline{)108}$ -6 48 18

6. $\frac{x+7}{3} \times \frac{11}{4}$ (Cross multiply!)

$4(x + 7) = 3 \cdot 11$

$4x + 28 = 33$

$-28 \quad -28$

$\frac{4x}{4} = \frac{5}{4}$

$x = 1\frac{1}{4}$

Name Answer key

Period _____

Original Score

Algebra – Unit 1 Extra Practice

I can solve equations in context.

Be sure to define your variables, write an equation, and write your answer in a complete sentence.

1. Carl makes $55,000 and is getting annual raises of $2,500. His wife, Claire, makes $62,000 with annual raises of $2,000. How many years will it take for the couple to make $180,000 together?

variable

y = years

Carl + Claire = 180,000

$(55{,}000 + 2{,}500y) + (62{,}000 + 2{,}000y) = 180{,}000$

$117{,}000 + 4{,}500y = 180{,}000$

$-117{,}000 \quad -117{,}000$

$\frac{4{,}500y}{4{,}500} = \frac{63{,}000}{4{,}500}$

$y = 14$

(simplified #s)

$55 + 2.5y + 62 + 2y = 180$

$117 + 4.5y = 180$

$-117 \quad -117$

$\frac{4.5y}{4.5} = \frac{63}{4.5}$

$y = 14$

It will take 14 years!

2. You are starting a pool cleaning business. You charge $20 per pool and have already spent $100 on supplies. If you want to make $750 profit this season, how many pools do you need to clean?

variable p = pools

$20p - 100 = 750$

$+100 \quad +100$

$\frac{20p}{20} = \frac{850}{20}$

$p = 42.5$

You need to clean 43 pools!

3. Tim is choosing between cell phone plans with the same number of free minutes. AT&T charges $39.99 per month with additional minutes costing $0.45. Verizon's plan costs $44.99 with additional minutes at $0.40. How many additional minutes until the plans to cost the same?

variable m = additional min

AT&T = Verizon

$39.99 + 0.45m = 44.99 + 0.4m$

$-0.4m \quad -0.4m$

$39.99 + 0.05m = 44.99$

$-39.99 \quad -39.99$

$0.05m = 5$

$\frac{100}{5} \cdot \frac{5}{100}m = 5 \cdot \frac{100}{5}$

$m = 100$

100 additional minutes will make the plans cost the same!

4. You need to paint your 2,200 square foot house using two types of paint. One gallon of glossy paint covers 140 square feet, and one gallon of matte paint covers 175 square feet. If you buy 9 gallons of glossy paint, how many gallons of matte paint should you buy?

variable p = matte paint

$2{,}200 = 9(140) + p(175)$

$2{,}200 = 1{,}260 + 175p$

$-1{,}260 \quad -1{,}260$

$940 = 175p$

$\frac{940}{175} = \frac{175p}{175}$

$5.4 = p$

I need to buy 6 gallons of matte paint.

5. The perimeter of the rectangle is 24 meters. Solve for x.

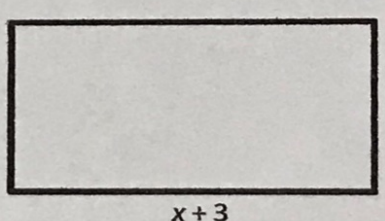
$(2x-6) + (x+3) + (2x-6) + (x+3) = 24$

$6x - 6 = 24$

$+6 \quad +6$

$\frac{6x}{6} = \frac{30}{6}$

$x = 5$



Name Answer Key

Period _____

Original Score

Algebra – Unit 1 Extra Practice

I can solve equations with variables on both sides.

1. $-3x = \frac{1}{2}(x+6) - 10$

$-3x = \frac{1}{2}x + 3 - 10$

$-3x = \frac{1}{2}x - 7$

$-\frac{1}{2}x \quad -\frac{1}{2}x$

$-\frac{7}{2}x = -7$ (Multiply by the reciprocal!)

$-\frac{2}{7} \cdot -\frac{7}{2}x = -7 \cdot -\frac{2}{7}$

$x = 2$

OR

$-3x = \frac{1}{2}(x+6) - 10$

$+10 \qquad +10$

$2 \cdot -3x + 10 = \frac{1}{2}(x+6) \cdot 2$

$-6x + 20 = x + 6$

$-x \qquad -x$

$-7x + 20 = 6$

$-20 \quad -20$

$\frac{-7x}{-7} = \frac{-14}{-7}$

$x = 2$

2. $16x - 7 + 4x = 12x - 1$ (combine)

$20x - 7 = 12x - 1$

$-12x \quad -12x$

$8x - 7 = -1$

$+7 \quad +7$

$8x = 6$

$\frac{8x}{8} = \frac{6}{8}$

$x = \frac{3}{4}$

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

$-m + 4 = 8m - 8$

$+m \qquad +m$

$4 = 9m - 8$

$+8 \qquad +8$

$12 = 9m$

$\frac{12}{9} = \frac{9m}{9}$

$1\frac{1}{3} = m$

4. $x + 5x + 4 = 3(2x - 1)$

$6x + 4 = 6x - 3$

$-6x \qquad -6x$

$4 \neq -3$

no solution

5. $\frac{1}{2}(2 - 4x) = 1 - 2x$

$1 - 2x = 1 - 2x$

$+2x \quad +2x$

$1 = 1$

infinite solution

6. $8 \cdot \frac{3x-5}{8} = -5x - 6 \cdot 8$ (multiply by 8!)

$3x - 5 = 8(-5x - 6)$

$3x - 5 = -40x - 48$

$+40x \qquad +40x$

$43x - 5 = -48$

$+5 \quad +5$

$\frac{43x}{43} = \frac{-43}{43}$

$x = -1$

Name Answer Key

Period _____

Original Score

Algebra – Unit 1 Extra Practice

I can solve for different variables in literal equations.

1. $A = 2(L + W)$ Solve for W.

Got rid of this 2!

$\frac{A}{2} = \frac{2(L+W)}{2}$

$\frac{A}{2} = L + W$

$-L \quad -L$

$\frac{A}{2} - L = W$

OR

$A = 2(L+W)$

$A = 2L + 2W$

$-2L \quad -2L$

$A - 2L = 2W$

$\frac{A-2L}{2} = \frac{2W}{2}$

$\frac{A-2L}{2} = W$

2. $\frac{x+y}{3} = 5$ (Multiply by 3) Solve for x.

$3 \cdot \frac{x+y}{3} = 5 \cdot 3$

$x + y = 15$

$-y \quad -y$

$x = 15 - y$

$x = 15 - y$

3. $A = 4r^2$ Solve for r^2.

$\frac{A}{4} = \frac{4r^2}{4}$

$\frac{A}{4} = r^2$

4. $A = \frac{r}{2L}$ Solve for L.

Multiply by 2L!

$2L \cdot A = \frac{r}{2L} \cdot 2L$

$\frac{2LA}{2A} = \frac{r}{2A}$

$L = \frac{r}{2A}$

5. $V = \pi r^2 h$ Solve for h.

$\frac{V}{\pi r^2} = \frac{\pi r^2 h}{\pi r^2}$

$\frac{V}{\pi r^2} = h$

6. $P = \frac{R-C}{N}$ Solve for R.

Multiply by N!

$N \cdot P = \frac{R-C}{N} \cdot N$

$NP = R - C$

$+C \quad +C$

$NP + C = R$