Name: __ANSWERS__ Date: _____

Algebra Mastery Test Practice 2 (2018)
All questions are worth 3 points.

Solve for the variable.

1) $\boxed{7y} + 5 \boxed{- 3y} = -31$

$$4y + 5 = -31$$
$$ - 5 \mid -5$$
$$4y = -36$$
$$\div 4 \mid \div 4$$
$$y = -9$$

1) $\underline{y = -9}$

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2) $8(b + 7) = 32 + 2b$

$$8b + 56 = 32 + 2b$$
$$-2b \mid -2b$$
$$6b + 56 = 32$$
$$-56 \mid -56$$
$$6b = -24$$
$$\div 6 \mid \div 6$$
$$b = -4$$

2) $\underline{b = -4}$

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3) $\frac{1}{3}(15n - 9) = 3n + 20$

$$5n - 3 = 3n + 20$$
$$-3n \mid -3n$$
$$2n - 3 = 20$$
$$+3 \mid +3$$
$$2n = 23$$
$$\div 2 \mid \div 2$$
$$n = 11.5$$

3) $\underline{n = 11.5}$

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4) $6(c - 5) - 3c = c + 10$

$$\boxed{6c} - 30 \boxed{-3c} = c + 10$$
$$3c - 30 = c + 10$$
$$-c \mid -c$$
$$2c - 30 = 10$$
$$+30 \mid +30$$
$$2c = 40$$
$$\div 2 \mid \div 2$$
$$c = 20$$

4) $\underline{c = 20}$

Model each rule with a table of values and then graph.

5) $y = -2x + 5$

x	Rule: $y = -2x + 5$	y
-1	$-2(-1) + 5$	7
0	$-2(0) + 5$	5
1	$-2(1) + 5$	3
2	$-2(2) + 5$	1
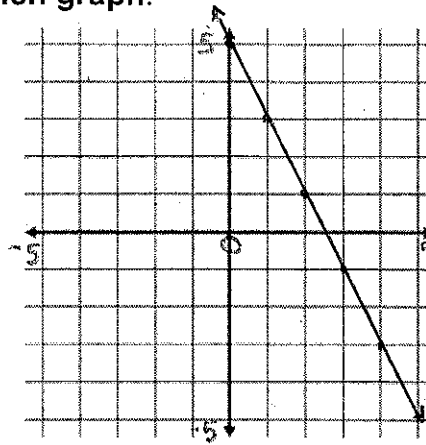
5) see left

6) $y = \frac{1}{3}x - 2$

x	Rule: $y = \frac{1}{3}x - 2$	y
-1	$\frac{1}{3}(-1) - 2$	$-2\frac{1}{3}$
0	$\frac{1}{3}(0) - 2$	-2
1	$\frac{1}{3}(1) - 2$	$-1\frac{2}{3}$
2	$\frac{1}{3}(2) - 2$	$-1\frac{1}{3}$
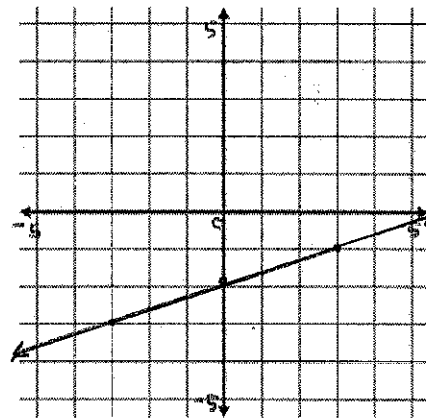
6) see left

Find the function rule.

7)

x	Y
-3	10
-1	-3
1	4
3	11

$m = \frac{7}{2} = 3\frac{1}{2}$

$y - y_1 = m(x - x_1)$

$y - 4 = 3\frac{1}{2}(x - 1)$

$y - 4 = 3\frac{1}{2}x - 3\frac{1}{2}$

$+4 \qquad\qquad +4$

$y = 3\frac{1}{2}x + \frac{1}{2}$

7) $y = 3\frac{1}{2}x + \frac{1}{2}$

8)

x	y
-1	$-2\frac{1}{4}$
1	-2
3	$-1\frac{3}{4}$
5	$-1\frac{1}{2}$

$m = \frac{1}{4} \div 2 = \frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$

$y - y_1 = m(x - x_1)$

$y + 2 = \frac{1}{8}(x - 1)$

$y + 2 = \frac{1}{8}x - \frac{1}{8}$

$-2 \qquad\qquad -2$

$y = \frac{1}{8}x - 2\frac{1}{8}$

8) $y = \frac{1}{8}x - 2\frac{1}{8}$

9) Sarah has hired a go-kart track for her birthday. She paid a deposit of $120 then will pay $25 for each friend she invites. Write an equation and state how much Sarah will pay if a total of 8 people drive go-karts.

9) $320

$$y = 25x + 120$$
$$y = 25(8) + 120$$
$$y = 200 + 120$$
$$y = \$320$$

10) While babysitting you are asked to fill a paddling pool. The pool has 5 gallons of water already. The hose fills the pool with 2 gallons of water every minute. Write an equation and state how much water will be in the pool after 4 minutes.

10) 13 gal.

$$y = 2x + 5$$
$$y = 2(4) + 5$$
$$y = 8 + 5$$
$$y = 13 \text{ gallons}$$

Write each equation in Standard Form using integers.

11) $2y = \frac{2}{3}x - 14$ LCD = 3

$$-\frac{2}{3}x \mid -\frac{2}{3}x$$

$$-\frac{2}{3}x + 2y = -14 \longrightarrow 3\left(-\frac{2}{3}x + 2y = -14\right)$$

$$-2x + 6y = -42$$

11)
$$-2x + 6y = -42$$

12) $y = -\frac{1}{3}x + \frac{3}{4}$ LCD = 12 (3×4)

$$+\frac{1}{3}x \mid +\frac{1}{3}x$$

$$\frac{1}{3}x + y = \frac{3}{4} \longrightarrow 12\left(\frac{1}{3}x + y = \frac{3}{4}\right)$$
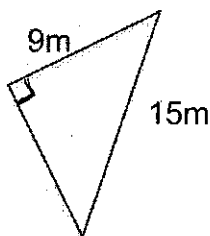
$$4x + 12y = 9$$

12)
$$4x + 12y = 9$$

Use Pythagorean Theorem to solve for the missing length.

13)

9m
15m

$$a^2 + b^2 = c^2$$
$$9^2 + b^2 = 15^2$$
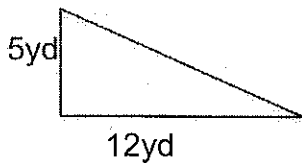$$81 + b^2 = 225$$
$$-81 \qquad -81$$
$$b^2 = 144$$
$$b = \sqrt{144} = 12m$$

13) 12 m

Use Pythagorean Theorem to solve for the missing length.

14)

5yd

12yd

$$a^2 + b^2 = c^2$$
$$5^2 + 12^2 = c^2$$
$$25 + 144 = c^2$$
$$169 = c^2$$
$$c = 13yd$$

14) __13yd__

Graph the following systems of equations
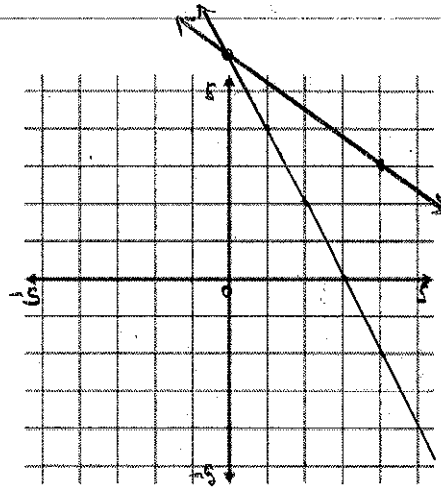
15) $y = -2x + 6$
$3x + 4y = 24$

$$3x + 4y = 24$$
$$-3x \qquad | \quad -3x$$
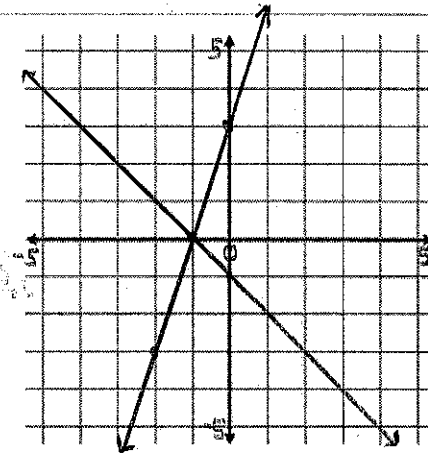$$\frac{4y}{4} = \frac{-3x + 24}{4}$$
$$y = -\frac{3}{4}x + 6$$

15) $(0, 6)$

Graph the following systems of equations

$y = 3x + 3$
$y = -x - 1$

) $(0, -1)$

Solve each system of equations using substitution.

16) $3x - y = 4$
$x + 5y = -4$
$\underline{-5y \quad | \quad -5y}$

$$x = -5y - 4$$

$$3x - y = 4$$
$$3(-5y - 4) - y = 4$$
$$\boxed{-15y - 12} - y = 4$$

$$-16y - 12 = 4$$
$$\underline{+12 \quad | \quad +12}$$
$$\frac{-16y}{-16} = \frac{16}{-16}$$
$$y = -1$$

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

16) $(1, -1)$

Solve each system of equations using substitution.

17) $x + y = 4$
   $y = 7x + 4$

$x + y = 4$
$x + (7x + 4) = 4$
$8x + 4 = 4$
   $-4 \mid -4$
$\dfrac{8x}{8} = \dfrac{0}{8}$
$x = 0$

$y = 7x + 4$
$y = 7(0) + 4$
$y = 4$

17) $(0, 4)$

Solve each system of equations using elimination

18) $x + y = 19$
   $x - y = -7$

$x + y = 19$
$-x - y = -7$

$2y = 26$
$\div 2 \mid \div 2$
$y = 13$

$x + y = 19$
$x + 13 = 19$
   $-13 \mid -13$
$x = 6$

18) $(6, 13)$

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19) $-3x + 4y = 29$
   $+ 3x + 2y = -17$

$6y = 12$
$\div 6 \mid \div 6$
$y = 2$

$-3x + 4y = 29$
$-3x + 4(2) = 29$
$-3x + 8 = 29$
   $-8 \mid -8$
$\dfrac{-3x}{-3} = \dfrac{21}{-3}$
$x = -7$

19) $(-7, 2)$

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20) The school that Stefan goes to is selling tickets to a choral performance. On the first day of ticket sales the school sold 3 senior citizen tickets and 1 child ticket for a total of $38. The school took in $52 on the second day by selling 3 senior citizen tickets and 2 child tickets. Find the price of a senior citizen ticket and the price of a child ticket.

$3x + 1y = 38$
$3x + 2y = 52$

$-y = -14$
$y = \$14$

$3x + y = 38$
$3x + 14 = 38$
   $-14 \mid -14$
$\dfrac{3x}{3} = \dfrac{24}{3}$
$x = \$8$

Senior Citizen tickets are $8 and Child tickets are $14.

20) _____

Simplify.

21) $\dfrac{4m^6n^4}{20m^4n}$ $\dfrac{4}{20} \cdot \dfrac{m^6}{m^4} \cdot \dfrac{n^4}{n} \cdot$

$\dfrac{1}{5} \cdot \dfrac{m^2}{1} \cdot \dfrac{n^3}{1}$

Answer: $\dfrac{m^2n^3}{5}$

22) $\dfrac{3ab^4d^3}{6a^4c}$ $\dfrac{3}{6} \cdot \left(\dfrac{a}{a^4}\right) \cdot \dfrac{b^4}{1} \cdot \dfrac{1}{c} \cdot \dfrac{d^3}{1}$

$\dfrac{1}{2} \cdot \dfrac{1}{a^3} \cdot \dfrac{b^4}{1} \cdot \dfrac{1}{c} \cdot \dfrac{d^3}{1}$

Answer: $\dfrac{b^4d^3}{2a^3c}$

Evaluate the expression. Write you answer in scientific notation. (2pts)

21) $(6.9 \times 10^{-5}) + (4.5 \times 10^{-4})$

0.69×10^{-4}

$\begin{array}{r} 0.69 \\ + 4.50 \\ \hline 5.19 \end{array}$

Answer: 5.19×10^{-4}

22) $(5.5 \times 10^4) - (2.3 \times 10^3)$

0.23×10^4

$\begin{array}{r} 5.50 \\ - 0.23 \\ \hline 5.27 \end{array}$

Answer: 5.27×10^4

23) $(2.4 \times 10^8) \times (1.4 \times 10^8)$

$2.4 \times 1.4 \times 10^{(8+8)}$

3.16×10^{16}

Answer: 3.16×10^{16}

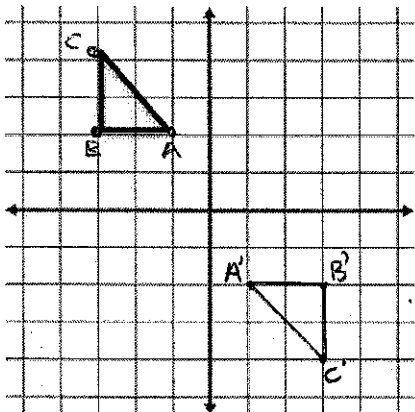**Evaluate the expression. Write you answer in scientific notation.** (2pts)

24) $(2.4 \times 10^6) \div (8 \times 10^2)$

$$8\overline{)2.4}^{\,0.3} \quad \text{or} \quad 3 \times 10^{-1} \times 10^{(6-2)}$$

$$3 \times 10^3$$

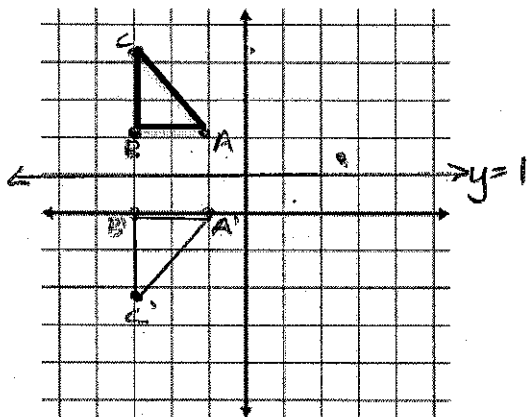Answer: 3×10^3

Rotate the triangle 180°.

23)

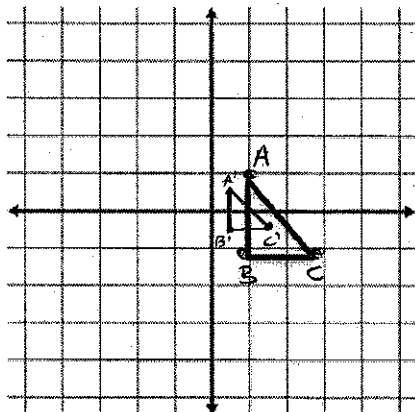**Reflect the triangle in the line y = 1.**

24)

Draw the triangle with dilation 0.5 about the origin.

25)

$$A(1,1) \xrightarrow{\times 0.5} A'\left(\tfrac{1}{2}, \tfrac{1}{2}\right)$$

$$B(1,-1) \rightarrow B'\left(\tfrac{1}{2}, -\tfrac{1}{2}\right)$$

$$C(3,-1) \rightarrow C'\left(1\tfrac{1}{2}, -\tfrac{1}{2}\right)$$