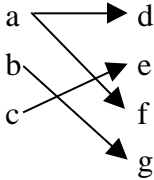
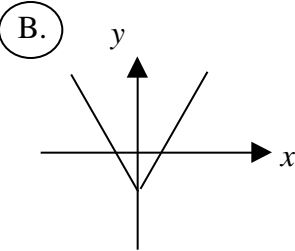
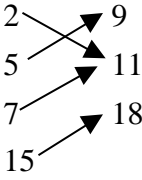
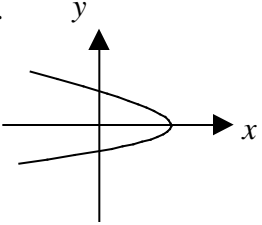
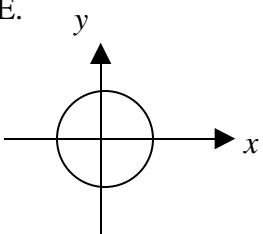


Name: SOLUTIONS

Place your answers in the spaces provided. You must show correct work to receive credit.

(5 pts) 1. Circle all of the following correspondences that are functions:

A.  B.  C. 

D.  E. 

(7 pts) 2. Given $h(x) = \frac{x+3}{5x-1}$, find and simplify $h(x+2)$.

$$h(x+2) = \frac{x+2+3}{5(x+2)-1} = \frac{x+5}{5x+10-1}$$

$h(x+2) = \frac{x+5}{5x+9}$

(10 pts) 3. Solve the following system of equations using either the substitution or elimination method. Express your answer as an ordered pair.

$$\begin{aligned} 5x - 3y &= 3 \\ 3x - 2y &= 1 \end{aligned}$$

$$\begin{aligned} \text{Mult. equation 1 by 2} \quad & 10x - 6y = 6 \\ \text{Mult. equation 2 by -3} \quad & -9x + 6y = -3 \end{aligned}$$

Add equations 1 and 2:

$$\begin{aligned} x &= 3 \\ 5(3) - 3y &= 3 \\ 15 - 3y &= 3 \\ -3y &= -12 \\ y &= 4 \end{aligned}$$

$(3,4)$

Name: SOLUTIONS

Place your answers in the spaces provided. You must show correct work to receive credit.

(12 pts) 4. Consider the line with equation $4x - 3y = 6$.

(6 pts) (a) Find the slope and the y -intercept of the line.

$$4x - 3y = 6$$

$$-3y = -4x + 6$$

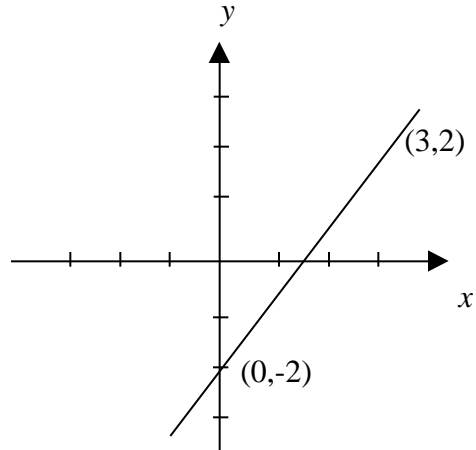
$$y = \frac{-4x + 6}{-3}$$

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

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

y -intercept: -2 or $(0, -2)$

(6 pts) (b) Graph the line of the set of axes below. You must label at least two points on your graph.



(16 pts) 5. Given $f(x) = x^2 - 1$ and $g(x) = -2x + 6$, find and simplify each of the following:

(4 pts) (a) $(f - g)(-3)$

$$\begin{aligned} f(-3) - g(-3) &= ((-3)^2 - 1) - (-2(-3) + 6) \\ &= (9 - 1) - (6 + 6) \end{aligned}$$

-4

(4 pts) (b) $(f \cdot g)(2)$

$$f(2) \cdot g(2) = (2^2 - 1) \cdot (-2(2) + 6) = 3 \cdot 2$$

6

(4 pts) (c) $\left(\frac{f}{g}\right)(x)$

$$\frac{f(x)}{g(x)} = \frac{x^2 - 1}{-2x + 6}$$

$\frac{x^2 - 1}{-2x + 6}$ or equivalent

(4 pts) (d) the domain of $\left(\frac{f}{g}\right)(x)$

$$\begin{aligned} -2x + 6 &\neq 0 \\ -2x &\neq -6 \end{aligned}$$

$x \neq 3$ or $\{x \mid x \neq 3\}$

Name: SOLUTIONS

Place your answers in the spaces provided. You must show correct work to receive credit.

(10 pts) 6. Total profit, P , is defined as total revenue minus total cost. Suppose total revenue is given by $R(x) = x^2 - 65x + 165$ and total cost is given by $C(x) = 6x + 1525$, where x is the number of widgets sold. Answer each of the following:

(6 pts) (a) Find and simplify the total profit as a function of x .

$$\begin{aligned}
 P(x) &= R(x) - C(x) \\
 &= (x^2 - 65x + 165) - (6x + 1525) \\
 &= x^2 - 65x + 165 - 6x - 1525
 \end{aligned}$$

$P(x) = x^2 - 71x - 1360$

(4 pts) (b) Use the function from part (a) to find the profit (or loss) from the sale of 95 widgets.

$$\begin{aligned}
 P(95) &= (95)^2 - 71(95) - 1360 \\
 &= 9025 - 6745 - 1360 = 920
 \end{aligned}$$

$\$920$

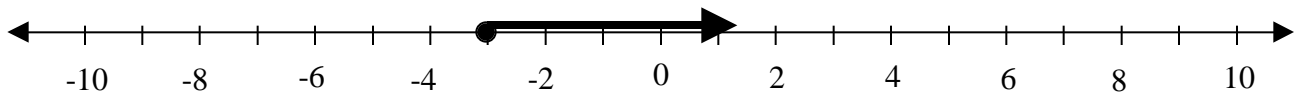
(8 pts) 7.

(4 pts) (a) Solve the following inequality for x . Express your answer in interval notation.

$$\begin{aligned}
 4x - 9 &> 7x \\
 -9 &> 7x - 4x \\
 -9 &> 3x \\
 -3 &> x \text{ or } x < -3
 \end{aligned}$$

$[-3,)$

(4 pts) (b) Graph your result from part (a).



(10 pts) 8. Find an equation of the line that passes through the point $(-2, 7)$ and is perpendicular to the line $y = \frac{1}{5}x + 8$. Leave your answer in the form $Ax + By = C$ where A , B , and C are integers.

$$\begin{aligned}
 m &= \frac{1}{5} \text{ so } m_{\text{perp.}} = -5 && \text{or} && y = mx + b \\
 y - y_1 &= m(x - x_1) && && 7 = (-5)(-2) + b \\
 y - 7 &= -5(x + 2) && && b = -3 \\
 y - 7 &= -5x - 10 && && y = -5x - 3
 \end{aligned}$$

$5x + y = -3 \text{ or } -5x - y = 3$

Name: SOLUTIONSPlace your answers in the spaces provided. You must show correct work to receive credit.

- (10 pts) 9. Abby recently got a new job in sales where she must choose between two salary plans. Plan A will pay her a salary of \$1200 per month plus a commission of 7% of her gross sales. Plan B will pay her a salary of \$1050 per month plus a commission of 9% of her gross sales. Find all amounts of gross sales for which Abby should choose Plan B. (Name a variable, set up an **inequality**, and solve.)

let x = amount of gross sales

Plan A $1200 + .07x$

Plan B $1050 + .09x$

Need Plan B > Plan A

$$1050 + .09x > 1200 + .07x$$

$$.02x > 150$$

$$x > 7500$$

$x > \$7500$

- (12 pts) 10. At a recent basketball game, the Ramblers made 38 baskets and scored 93 points. The only types of baskets made to score the 93 points were two-pointers and three-pointers. Find the number of each type of basket made. (Name a variable(s), set up an equation(s), and solve.)

let x = number of two- pointerslet y = number of three-pointers

$$x + y = 38$$

$$2x + 3y = 93$$

$$y = 38 - x \quad 2x + 3(38 - x) = 93$$

$$2x + 114 - 3x = 93$$

$$-x = -21$$

$$x = 21$$

$$y = 38 - 21 = 17$$

number of two-pointers = 21

number of three-pointers = 17

Name: **SOLUTIONS**