ALG III 12/8/17
Final Exam Review

1.   Solve each equation.

a. $4(7-x)=39-3(x+5)$ b. $11|x+6|=33$

c. $|x-21|+10=1$ d. $|x-4|=|x-6|$

2.   Solve each inequality. Represent your answer in INTERVAL NOTATION.

a. $4x-3<5x+2$ b. $\dfrac{-4x+22}{5}\geq -3x$

c. $3<4x-9\leq 19$ d. $x+7<-6 \text{ and } -2k\leq -18$

e. $9x+3<-6 \text{ or } 3x-7>5$ f. $|x+5|<8$

g. $3|5x-8|+6>12$ h. $|8x+6|+10\geq 2$

3.   During 2ⁿᵈ quarter, John has scored 82%, 90%, 76% and 81% on his Algebra III tests. What must he earn on the fifth test for his average score to be at least 85%?

4.   Emily mixed together 9 gal. of Brand A fruit drink and 8 gal. of Brand B fruit drink which contains 48% fruit juice. Find the percent of fruit juice in Brand A if the mixture contained 30% fruit juice.

5. Determine if the relation represents a function. State the domain and range.

a.
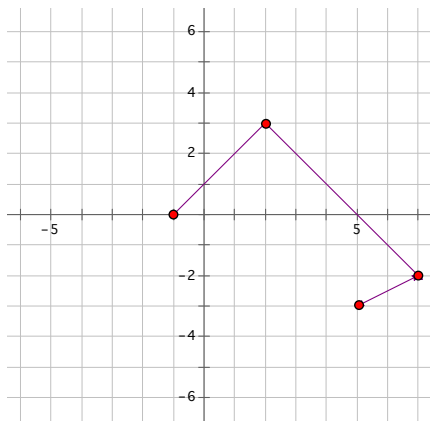
b.

X	Y
8	4
10	3
-4	2
-12	1
8	0

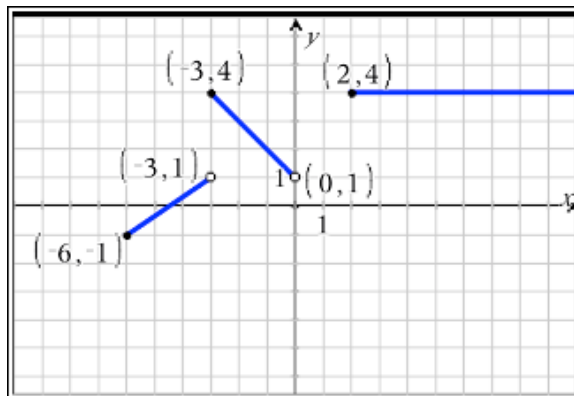Function: YES/NO

Domain:_____

Range:_____

Function: YES/NO

Domain:_____

Range:_____

6. Given the graph

a. Does the graph represent a function? How do you know?

b. Write an equation.

$$y = \begin{cases} \underline{\hspace{2cm}} \ for \ \underline{\hspace{2.5cm}} \\ \underline{\hspace{2cm}} \ for \ \underline{\hspace{2.5cm}} \\ \underline{\hspace{2cm}} \ for \ \underline{\hspace{2.5cm}} \end{cases}$$

c. Find $f(2)$.

d. State the domain and range. Use the correct notation!

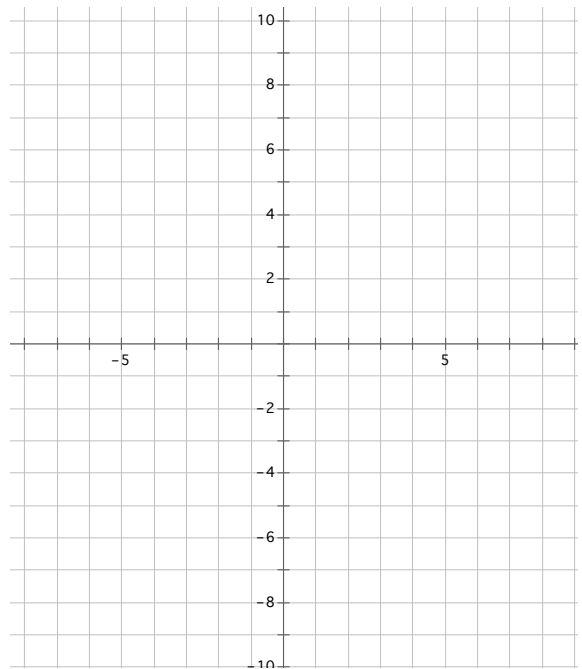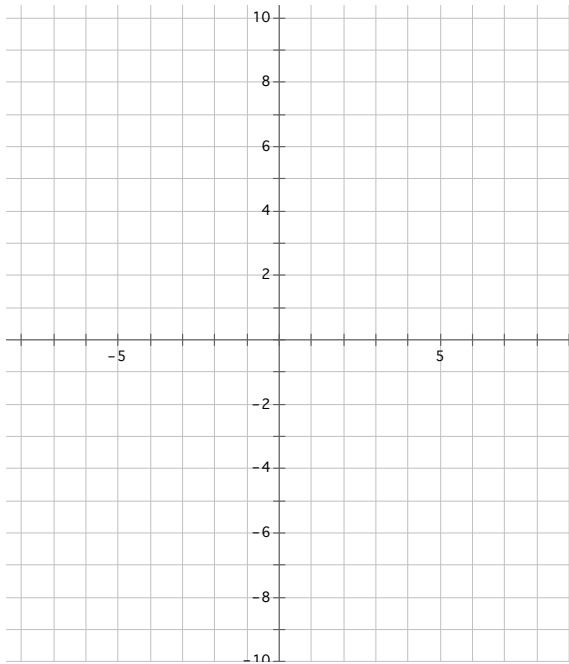e. On what intervals is the graph increasing and decreasing?

7. Write a linear equation that is perpendicular to the line $5x - 2y = 10$ and passes through the point $(-3, 7)$.

8. Write the equation of a horizontal line that passes through $(-1,\ 10)$.

9. Graph

a.
$$\begin{cases} y \geq 3x + 1 \\ y - 4 < -\dfrac{2}{3}(x+1) \end{cases}$$

b. $f(x) = \begin{cases} -\dfrac{1}{3}x - 2 & for & x \leq -3 \\ 2x & for & -2 \leq x \leq 1 \\ 1 & for & x > 1 \end{cases}$

10. Given $f(x) = x^2 - 5$ and $g(x) = -2x + 8$

Find:

a. $f(-2)$.

b. $g(0)$.

c. $f(a+2)$

d. $(f+g)(x)$

e. $(f \cdot g)(x)$

f. $(g-f)(x)$

g. $(f+g)(-1)$

h. $(f-g)(0)$

i. $\left(\dfrac{f}{g}\right)(1)$

j. $(g \cdot f)(4)$

k. $(g \circ f)(3)$

l. $(g \circ g)(2)$

m. $(f \circ g)(-1)$

n. $(g \circ f)(x)$

o. $(f \circ f)(x)$

11. Simplify completely. Be sure to show all your work.

  a. $x^5 y^3 \cdot x^{-2} y^6$

  b. $\left(x^3\right)^2$

  c. $\dfrac{x^{10}}{x^3}$

  d. $\left(2xy^4\right)^3$

  e. $\left(\dfrac{5}{x^7}\right)^{-1}$

  f. $\dfrac{1}{5^{-2}}$

  g. $\dfrac{3^2}{3^{-2}}$

  h. $\dfrac{2x^{-3} y^4 \cdot 6x^6 y}{4x^4 y^2}$

  i. $\left(\dfrac{4p^3 q^{-5}}{pq^{-1}}\right)^{-2}$

  j. $\dfrac{27x^8 y^2}{3xy^{11}}$

12. Divide.
  a. $\left(25x^5 - 15x^4 + 5x^3 - 30x^2 + 55x - 100\right) \div (5x)$

  b. $\left(2x^3 + 9x^2 + x - 12\right) \div (2x + 3)$

c. $(8x^4 + 16x^3 - 26x^2 - 8x + 3) \div (x + 3)$

13. Factor.

a. $9x^2 - 25$

b. $x^2 + 14x - 15$

c. $x^2 - x - 56$

d. $2x^2 - 8x + 3x - 12$

e. $4x^2 - 12x + 9$

f. $x^3 + 2x^2 - 9x - 18$

14. Solve.

a. $2x(2x - 18)(x + 7) = 0$

b. $x^2 + 7x = 30$

c. $2x^2 + x + 3 = 0$

d. $2x^2 - 30x + 108 = 0$