Name: Key

Math 163 Test #1

1) Solve the equation for x: $|-2x - 6| = 15$

$-2x - 6 = 15$ $\quad$ $-2x - 6 = -15$

$-2x = 21$ $\quad$ $-2x = -9$

$x = -\frac{21}{2}$ $\quad$ $x = \frac{9}{2}$

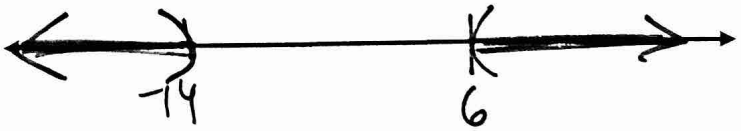
2) Solve and graph the inequality: $|2x + 8| - 7 > 13$

$|2x + 8| > 20$

$2x + 8 > 20$ $\quad$ $2x + 8 < -20$

$2x > 12$ $\quad$ $2x < -28$

$x > 6$ $\quad$ $x < -14$



3) Solve and graph the inequality: $-2|-3x + 1| + 4 < -12$

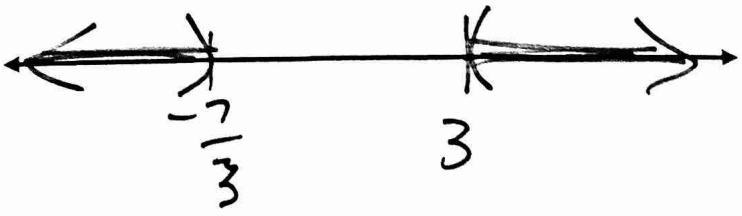
$-2|-3x+1| < -16$

$|-3x+1| > 8$

$-3x + 1 > 8$ $\quad$ $-3x + 1 < -8$

$-3x > 7$ $\quad$ $-3x < -9$

$x < -\frac{7}{3}$ $\quad$ $x > 3$



4) List the domain and range of the relation and then circle if the relation is a function.

{(-2, 5), (4, 7), (3, 7), (6, 5)}

Domain: $-2, 3, 4, 6$

Range: $5, 7$

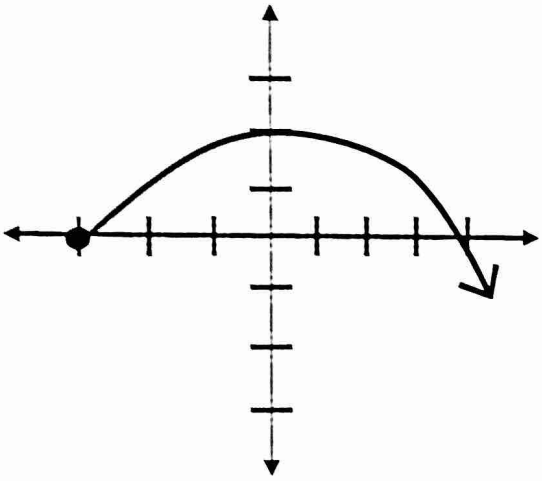
Is the relation a function?

(YES) / NO

6

5) For each graph provided state the domain and range and then circle either yes or no to tell if the relation is a function.

a)



Domain: $[-3, \infty)$

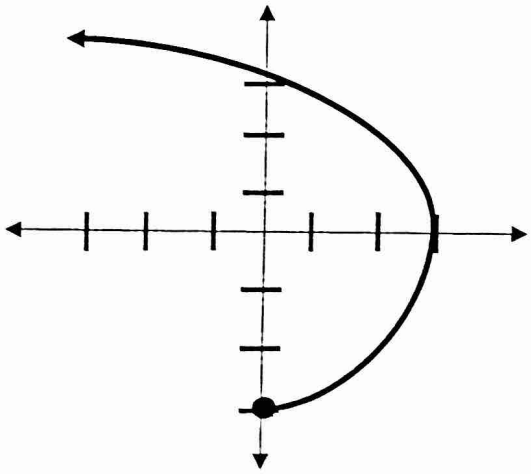
Range: $(-\infty, 2]$

Is the relation a function?

(YES) / NO

6

b)



Domain: $(-\infty, 3]$

Range: $[-3, \infty)$

Is the relation a function?

YES / (NO)

6

6) Find the vertex of the function: $g(x) = -2x^2 - 8x + 3$

$x = \frac{8}{-4} = -2$

$-2(-2)^2 - 8(-2) + 3$

$-2(4) + 16 + 3$

$-8 + 16 + 3$

11

$(-2, 11)$

6

7) Jamie throws a ball that will move through the air in a parabolic path due to gravity. The height, *h*, in meters, of the ball above the ground after "*t*" seconds can be modelled by the function $h(t) = -5t^2 + 40t + 2$. What are the coordinates of the vertex when the ball is at the maximum height?

$\frac{-40}{-10} = 4$

$-5(16) + 160 + 2$

$-80 + 160 + 2$

82

6

$(4, 82)$

8) True/False: The inequality $|3x - 5| > -4$, has NO Solution. FALSE

3

9) Given the function $g(x) = 4x^2 + 24x - 5$, write the function in vertex form, then state the vertex of the function using any method. $y = a(x - h)^2 + k$

$\frac{-24}{8} = -3$

$y = 4(x + 3)^2 - 41$

6

$36 - 72 - 5$

-41

10) Given the function $f(x) = 3x^2 - 4x + 2$ and $g(x) = |3x - 8| - 2$

Evaluate each:

$f(-2) =$ 22 4

$g(-2) + f(2) =$ 15 4

11) Describe the type of transformation that takes place from $f(x) \rightarrow g(x)$.

a) $f(x) = x^2$
$g(x) = (x-6)^2 - 7$

Right 6
Down 7

5

b) $f(x) = (x-4)^2 + 3$
$g(x) = (x+1)^2 - 2$

Left 5
Down 5

5

12) Match the graphs in the picture with the functions shown below:

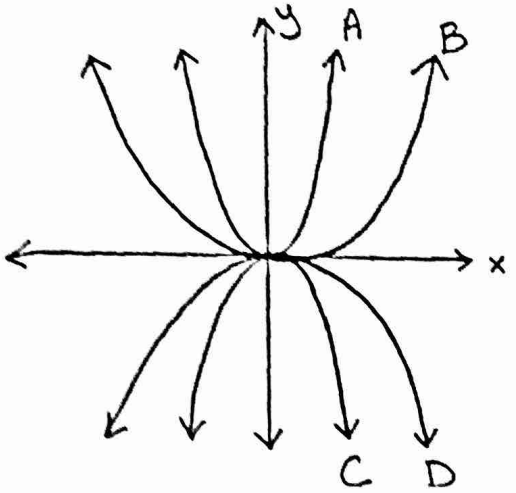
$f(x) = x^2$ B

$g(x) = -3x^2$ C

$h(x) = -2x^2$ D

$j(x) = 4x^2$ A

8



13) Describe the end behavior in each function:

a) $f(x) = -5x^4 + 3x^3 - 2x + 1$

As $x \to -\infty, f(x) \to -\infty$

As $x \to \infty, f(x) \to -\infty$

4

b) $g(x) = 3x^4 - 2x^3 - 5x - 2$

As $x \to -\infty, f(x) \to \infty$

As $x \to \infty, f(x) \to \infty$

4

14) a) Given the table below showing the cost of a movie ticket each year come up with a linear regression equation that "best fits" the data.

Year	Cost ($)
1	4.50
2	5.25
4	6.50
6	7.25
8	8.50

6

$y = .55x + 4.082$

b) Using the equation for the line of best fit, what would be the expected price of a ticket in year 10?

$9.60

3

EXTRA CREDIT:

1) What is the one thing you can put in a box and make it weigh less? (Hint: Not a gas)

+2