Math 2 Practice Final: Part 2

Name: _____ Hour:_____

Directions: Read all instructions completely. Show all of your work. No points will be given without appropriate work being shown and answers indicated.

3.10. Solve the following system of equations, show all your work.

1. $y = -x^2 - 5$
   $y = x^2 + 10x + 3$

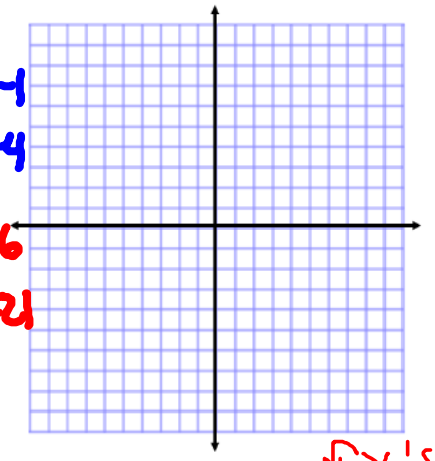
(use the graph if you would like)

$-x^2 - 5 = x^2 + 10x + 3$
$+x^2 \quad +x^2$
$-5 = 2x^2 + 10x + 3$
$+5 \quad +5$
$0 = 2x^2 + 10x + 8$
$(2x^2 + 8x) + (2x + 8)$
$2x(x+4) + 2(x+4)$
$(2x+2)(x+4)$

$2x + 2 = 0$
$-2 \quad -2$
$\frac{2x}{2} = \frac{-2}{2}$
$x = -1$

$x + 4 = 0$
$-4 \quad -4$
$x = -4$

$y = -(-1)^2 - 5 = -6$
$y = -(-4)^2 - 5 = -21$
$(-1, -6)$
$(-4, -21)$



x's

2. Given the equation: $f(x) = -3x^2 + 5$ Find the average rate of change over the interval [-1,3] :

A.R.C $\frac{y-y}{x-x}$

$y = -3(-1)^2 + 5 = 2$
$y = -3(3)^2 + 5 = -22$

$\frac{2 + 22}{-1 - 3} = \frac{24}{-4} = -6$

3. Given the following graph, find the average rate of change over the interval [2, 5]

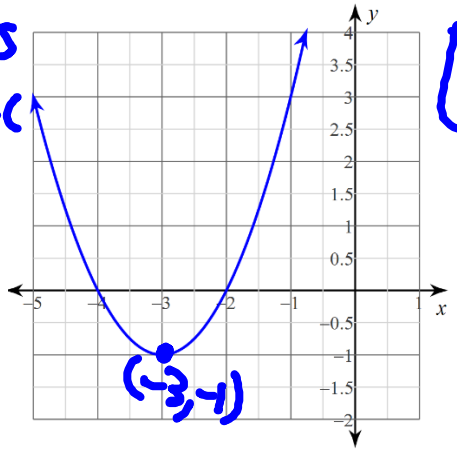
$\frac{4-1}{2-5} = \frac{3}{-3} = -1$

4. Write a quadratic equation given the graph below.

3 points in calc

or

find
a = 1
h = -3
k = -1



$y = (x+3)^2 - 1$

$A = L \cdot W$

5. Given the following rectangle, calculate the area of the rectangle:

$(-2x+13)(4x-5)$

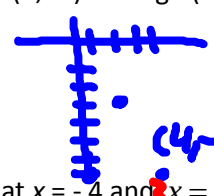
$-8x^2+10x+52x-65$

$-8x^2+62x-65$

Write a quadratic function that fits the given criteria.

6. Vertex at (2, -3) through (0, -7), written in vertex form:

3 pts.



$y=-x^2+4x-7$

$(4,-7)$

$a=-1$

$y=-(x-2)^2-3$

$-7=a(0-2)^2-3$

$-7=a(-2)^2-3$

$-7=4a-3$

$+3 \quad +3$

$\frac{-4}{4}=\frac{4a}{4}$ $\quad a=-1$

7. Solution at $x = -4$ and $x = \frac{2}{3}$, written in standard form:

$x+4=0$

$-4 \quad -4$

$x=-4$

$3x=2$

$-2 \quad -2$

$3x-2=0$

$(x+4)(3x-2)$

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

$y=3x^2+10x-8$

8. If a football is kicked straight upward, then the height $h(t)$ of the football in feet at time t in seconds is given by $\boldsymbol{h(t) = -16t^2 + 64t + 10}$. (time, height)

a) What is the height of the football 4 seconds after it is kicked?

want y $\quad t=4 \quad -16(4)^2+64(4)+10 =$ 10 ft

b) How long does it take for the football to return to earth (round to the nearest hundredth)?

want x $\quad y=0$ $\quad$ x int.

$0=-16t^2+64t+10$

$x=\frac{-64 \pm \sqrt{(64)^2-4(-16)(10)}}{2(-16)}$ $\quad$ 4.15 sec

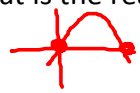
c) How long does it take to reach the maximum height?

time vertex $\quad h=\frac{-b}{2a} \quad \frac{-64}{2(-16)} =$ 2 sec

d) What is the maximum height?

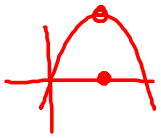
height vertex $\quad k=-16(2)^2+64(2)+10 =$ 74 ft

e) What is the real world domain of the function?



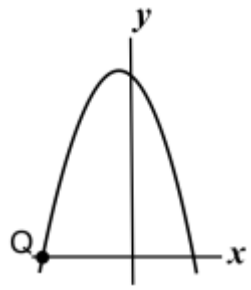
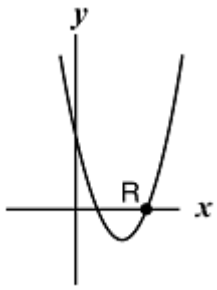
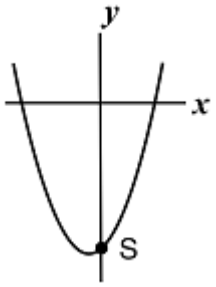
D: [0, 4.15]

f) What is the real world range of the function?



R: [0, 74]

9. Here are 4 equations of quadratic functions and 4 sketches of graphs of quadratic functions.

A. $y = x^2 - 6x + 8$	B. $y = (x - 6)(x + 8)$	C. $y = (x - 6)^2 + 8$	D. $y = -(x + 8)(x - 6)$
A. 	B 	C 	D 

Match the equation to its graph and explain your decision.

Equation A ***matches*** Graph __C__, because x int. are 2 & 4, y int. 8, faces up

Equation B ***matches*** Graph __D__, because faces up, y int. -48, x int. 6 & -8

Equation C ***matches*** Graph __A__, because vertex is (6,8), no x int., faces up

Equation D ***matches*** Graph __B__, because faces down x int. -8 & 6, y int.

10. Write the coordinates of the points:

$P(6, 8)$ $Q(-8, 0)$ $R(4, 0)$ $S(0, -48)$