

## HW 3 - 7: Answers

# 1. $(y + 2)^2 = 4(x - 2)$

**2.  $(x + 3)^2 = -8(y + 1)$**


### 3. $(y + 1)^2 = 2(x + 5)$

**4.  $y = -1/8(x - 2)^2 - 4$**

5.  $k = 12$

$(y+3)^2 = k(x-2)$   $P(2, 5)$   
 $\rightarrow V(2, -3)$

$p = -2$   $x = 4p = 4(-2) = -8$



Write the equations of the parabolas in standard form. Find all required parts and graph.

1.  $y^2 - 4x + 4y + 12 = 0$

$|4p| = \underline{4}$

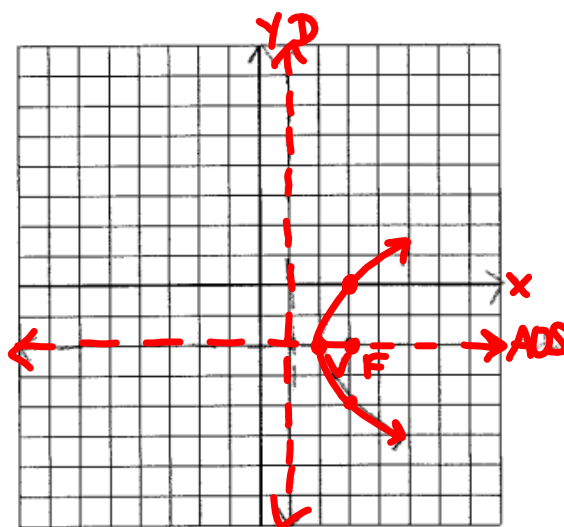
$p = \underline{1}$

Vertex:  $\underline{(2, -2)}$

Focus:  $\underline{(3, -2)}$

Directrix:  $\underline{x=1}$

AOS:  $\underline{y=-2}$



$$y^2 + 4y + 4 = 4x - 12 + 4$$

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

$$y^2 = + \curvearrowright$$

2.  $x^2 + 6x + 8y + 17 = 0$

$|4p| = \underline{8}$

$p = \underline{2}$

Vertex:  $\underline{(-3, -1)}$

Focus:  $\underline{(-3, -3)}$

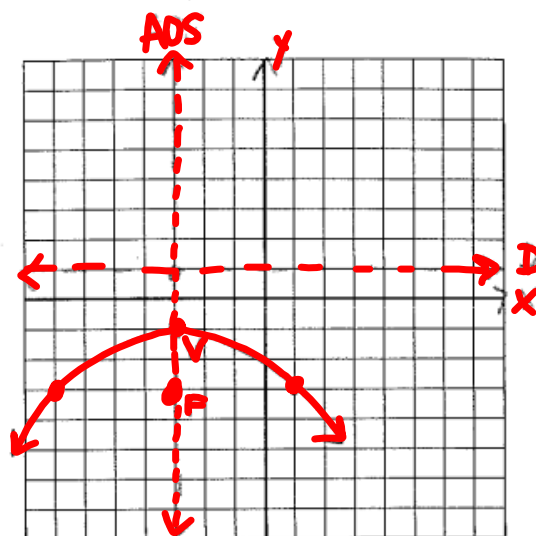
Directrix:  $\underline{y = 1}$

AOS:  $\underline{x = -3}$

$$x^2 + 6x + 9 = -8y - 17 + 9$$

$$(x+3)^2 = -8(y+1)$$

$$x^2 = - \quad \curvearrowright$$



3.  $y^2 - 2x + 2y - 9 = 0$

$|4p| = \underline{2}$

$p = \underline{1/2}$

Vertex:  $\underline{(-5, -1)}$

Focus:  $\underline{(-7/2, -1)}$

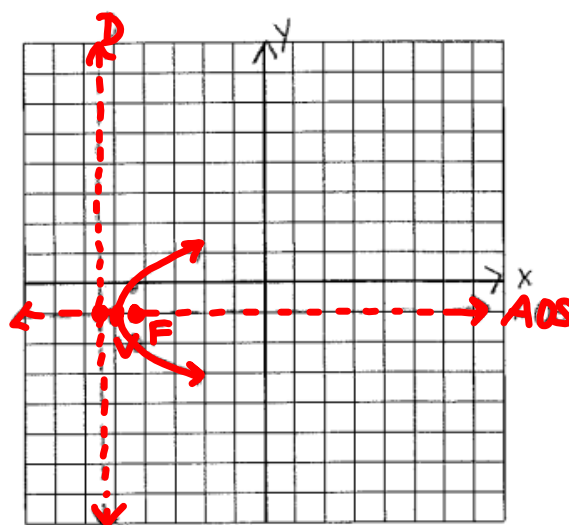
Directrix:  $\underline{x = -11/2}$

AOS:  $\underline{y = -1}$

$y^2 + 2y + 1 = 2x + 9 + 1$

$(y + 1)^2 = 2(x + 5)$

$y^2 = + 3$



4. Solve for  $y$ :  $(x - 2)^2 = -8(y + 4)$

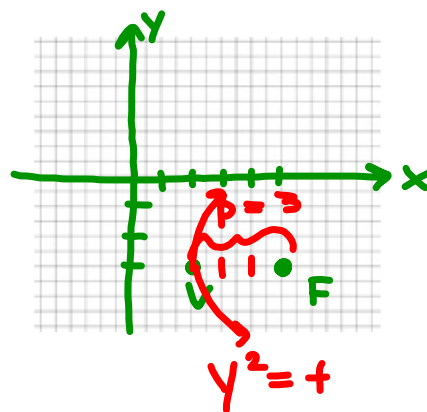
$$-\frac{1}{8}(x-2)^2 = y+4$$

$$y = -\frac{1}{8}(x-2)^2 - 4$$

5. The focus of the parabola  $(y + 3)^2 = k(x - 2)$  is  $(5, -3)$ ; find  $k$ . The use of the grid is optional.

$$V: (2, -3)$$
$$y^2 = \curvearrowright \text{ or } \curvearrowleft$$

$$4p = 12$$
$$\therefore k = 12$$



With your group, answer each of the following questions. Show work or write an explanation for each question. Your homework tonight is to finish this worksheet.

## Do #1 together in Class

Using your graphing calculator, solve the following systems of equations. Round your answers to the nearest hundredth. State the window you used for each system.

$$y = -3x^2 - 5x + 2$$

$$y = 3x - 4$$

NORMAL FLOAT AUTO REAL RADIAN MP

WINDOW

Xmin=-5

Xmax=5

Xscl=1

Ymin=-15

Ymax=5

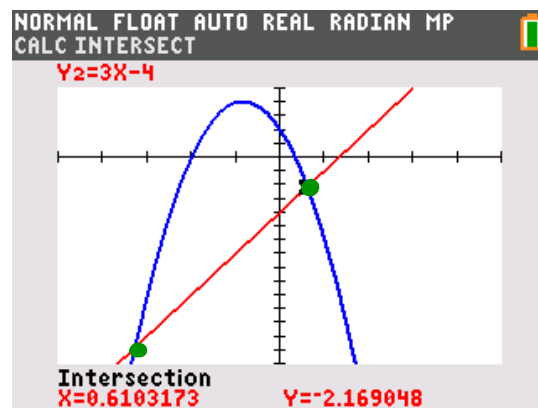
Yscl=1

Xres=1

ΔX=0.03787878787878

TraceStep=0.075757575757...

$\{(-3.28, -13.83),$   
 $(0.61, -2.17)\}$



Using your graphing calculator, solve the following systems of equations. Round your answers to the nearest hundredth. State the window you used for each system.

1.  $y = -3x^2 - 5x + 2$   
 $y = 3x - 4$

Solution:  $\{(61, -2.17), (-3.27, -13.83)\}$

Window:

Xmin -10

Xmax 10

Ymin -30

Ymax 10

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

Solution:  $\{(-32, 2.35), (12.32, 27.65)\}$

Window:

Xmin -10

Xmax 15

Ymin -5

Ymax 50



For many of these questions, you will use your calculator. You may need to change your window, use your table to help if necessary.

3. June 2017 #5

If  $f(x) = 3|x| - 1$  and  $g(x) = 0.03x^3 - x + 1$ , an approximate solution for the equation  $f(x) = g(x)$  is

- a. 1.96  
c.  $(-0.99, 1.96)$

- ☒ b. 11.29  
d.  $(11.29, 32.87)$

Window:

Xmin -5

Xmax 15

Ymin -5

Ymax 60

solution  $\rightarrow$  x-values only  
in this problem

## 4. June 2017 #17

A parabola has its focus at (1, 2) and its directrix is  $y = -2$ . The equation of the parabola could be

a.  $y = 8(x + 1)^2$

b.  $y = 8(x - 1)^2$

c.  $y = \frac{1}{8}(x + 1)^2$

d.  $y = \frac{1}{8}(x - 1)^2$

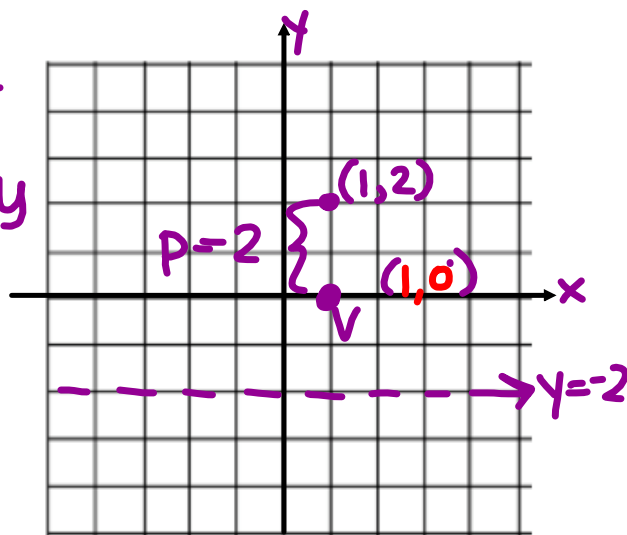
$$x^2 = +$$

$$(x-1)^2 = 8y$$

$$(x-h)^2 = 4p(y-k)$$

$$(x-1)^2 = 4(2)(y-0)$$

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



5. August 2016 #19

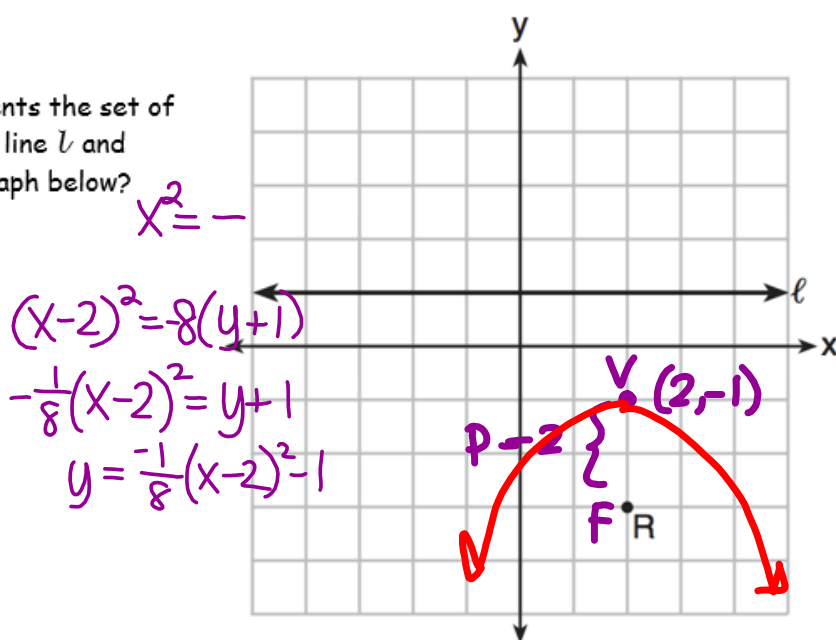
Which equation represents the set of points equidistant from line  $\ell$  and point R shown on the graph below?

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

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

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

d.  $y = -\frac{1}{8}(x-2)^2 - 1$



6. August 2016 #3

To the *nearest tenth*, the value of  $x$  that satisfies  $2^x = -2x + 11$  is

a. 2.5

b. 5.8

c. 2.6

d. 5.9

Window:

Xmin -10

Xmax 10

Ymin -10

Ymax 10

} Regular Zoom 6 works Great!

7. August 2017 #19 - For this question, you do not know what "imaginary" means yet, but you have enough information to determine the answer. Hint: Type the two (well, really 3) equations into  $y =$  and determine the point(s) of intersection. What kind of numbers are they?

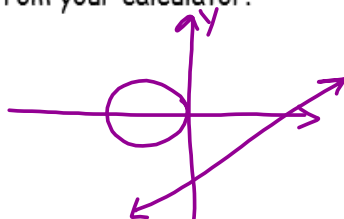
Consider the system shown below.

$$\begin{array}{lcl} 2x - y = 4 & \longrightarrow & y = 2x - 4 \\ (x + 3)^2 + y^2 = 8 & \longrightarrow & y = \pm \sqrt{8 - (x + 3)^2} \end{array}$$

The two solutions of the system can be described as

- a. both imaginary      b. both rational  
c. both irrational      d. one rational and one irrational

Sketch the image from your calculator.



8. June 2016 #33

Solve the system of equations shown below algebraically.

$$\begin{array}{l|l}
 x+y=5 & \\
 x=7 & x=3 \\
 7+y=5 & 3+y=5 \\
 y=-2 & y=2 \\
 \hline
 \{(7,-2), (3,2)\}
 \end{array}$$

$$\begin{aligned}
 (x-3)^2 + (y+2)^2 &= 16 \\
 2x+2y &= 10 \quad \div 2 \\
 x+y &= 5 \\
 y &= 5-x \\
 (x-3)^2 + (5-x+2)^2 &= 16 \\
 (x-3)^2 + (7-x)^2 &= 16 \\
 x^2 - 6x + 9 + x^2 - 14x + 49 &= 16 \\
 2x^2 - 20x + 58 &= 16 \quad \div 2 \\
 x^2 - 10x + 29 &= 8 \\
 x^2 - 10x + 21 &= 0 \\
 (x-7)(x-3) &= 0 \\
 x=7 \quad x=3
 \end{aligned}$$

## Work of the Castle Learning