

HW 3 - 5: Answers**1 - 3: Check with Partner**

4. $x = -1, y = -2, z = 1$

[Quiz today](#) on solving a parabola/line system both algebraically & graphically like HW 3-4 #s 1 & 2. Let me know if you have a ? as I go over homework.

[Castle Learning Unit 3 Review](#) is also available now for extra practice. You all should do it.

Aug 13-9:18 AM

Graph each of the parabolas given without the use of a calculator. Find and label all parts.

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

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

$p = \underline{1}$

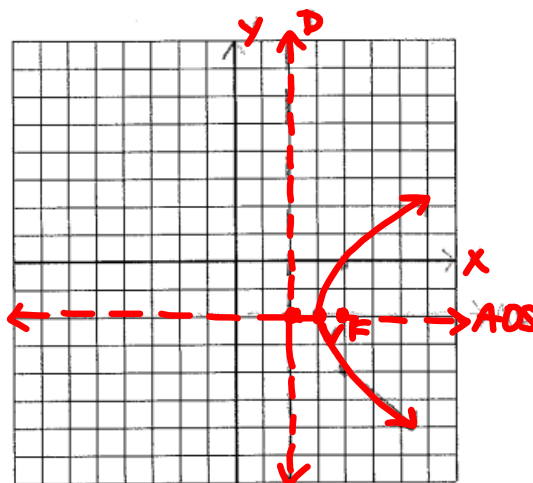
Vertex: $\underline{(3, -2)}$

Focus: $\underline{(4, -2)}$

Directrix: $\underline{x = 2}$

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

$y^2 = +$



Aug 13-12:18 PM

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

$x^2 = -$

$|4p| = 2$ width = 1 + 1

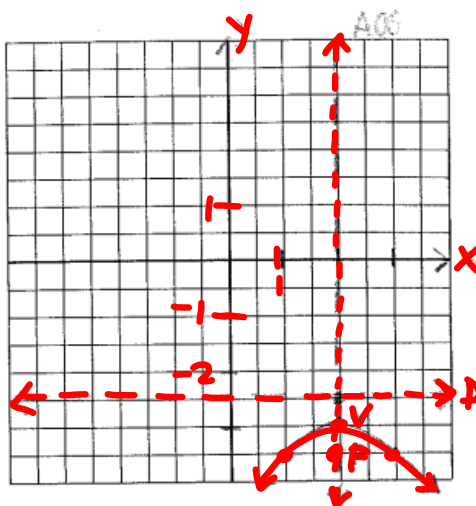
$p = 1/2$ r-F, r-D

Vertex: $(2, -3)$

Focus: $(2, -7/2)$

Directrix: $y = -5/2$

AOS: $x = 2$



Aug 13-12:19 PM

3.

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

$|4p| = 8$

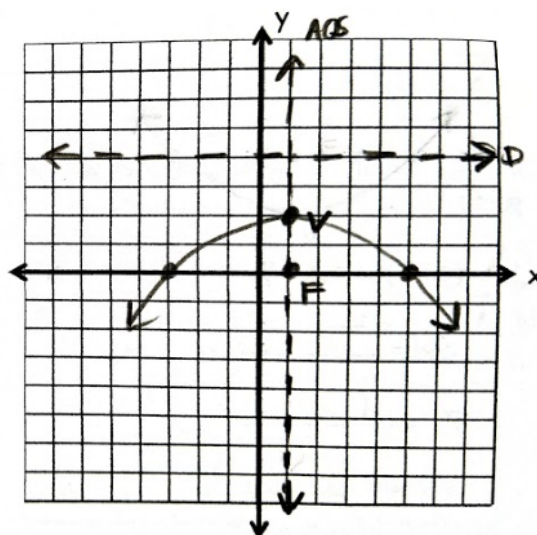
$p = -2$

Vertex: $(1, 2)$

Focus: $(1, 0)$

Directrix: $y = 4$

AOS: $x = 1$



4. Solve the system algebraically. Check your answer with your GC.

$$\begin{array}{l} \textcircled{1} \quad 3x - 2y + z = 2 \\ \textcircled{2} \quad 2x + 3y + 2z = -6 \\ \textcircled{3} \quad 3x - y + z = 0 \end{array}$$

$$-2\textcircled{1} + \textcircled{2}$$

$$\begin{array}{r} -6x + 4y - 2z = -4 \\ 2x + 3y + 2z = -6 \\ \hline -4x + 7y = -10 \end{array}$$

$$-2\textcircled{3} + \textcircled{2}$$

$$\begin{array}{r} 2x + 3y + 2z = -6 \\ -6x + 2y - 2z = 0 \\ \hline -4x + 5y = -6 \\ 4x - 5y = 6 \end{array}$$

$$\begin{array}{r} -4x + 7y = -10 \\ 4x - 5y = 6 \\ \hline 2y = -4 \end{array}$$

$$\begin{array}{r} 2y = -4 \\ y = -2 \end{array}$$

$$\begin{array}{r} 4x + 10 = 6 \\ x = -1 \end{array}$$

$$\begin{array}{r} -3 + 2 + z = 0 \\ z = 1 \end{array}$$

$$\begin{array}{l} x = -1 \\ y = -2 \\ z = 1 \end{array}$$

Review HW 3 - 4: #1 & 2 (Quiz today)

$$1. \quad y = -x^2 + 4x + 2$$

$$2x + y = 7$$

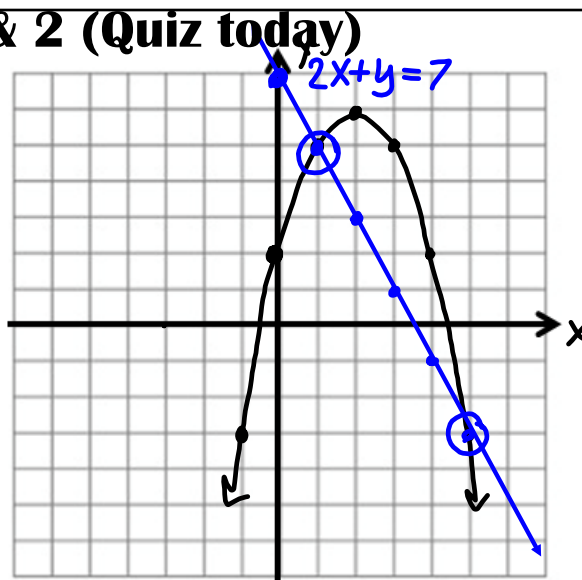
$$y = -2x + 7$$

$$m = -2$$

$$b = 7$$

x	-1	0	1	2	3	4	5
y	-3	2	5	6	5	2	-3

$$\{(1, 5), (5, -3)\}$$



$$2. \ y = x^2 + 5x - 10$$

$$y = 2x + 18$$

$$x^2 + 5x - 10 = 2x + 18$$

$$x^2 + 3x - 28 = 0$$

$$(x+7)(x-4) = 0$$

$$\{(-7, 4), (4, 26)\}$$

$$\begin{array}{l|l} x = -7 & x = 4 \\ y = 2(-7) + 18 & y = 2(4) + 18 \\ y = 4 & y = 26 \end{array}$$

Sep 9-9:32 PM

U3D6

More Parabolas

Aug 13-9:09 AM

Warm-up **Not In Your Notes** - State which direction the parabola will open:

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

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

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

4. $(y - 5)^2 = 7(x + 4)$

Oct 21-7:18 AM

Warm-up **Not In Your Notes** - State which direction the parabola will open:

1. $(x - 3)^2 = 5(y - 2)$ $x^2, +4p$

2. $(y - 2)^2 = -3(x + 1)$ $y^2, -4p$

3. $(x + 4)^2 = -2(y + 3)$ $x^2, -4p$

4. $(y - 5)^2 = 7(x + 4)$ $y^2, +4p$

Oct 21-7:18 AM

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

1. $x^2 - 4x - 4y + 8 = 0$

$\left(\frac{b}{2}\right)^2$

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

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

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

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

$x^2 = +4p$

Solve for y: $\frac{1}{4}(x-2)^2 = (y-1)$

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

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

$|4p| = 4$ (width = $2+2$)

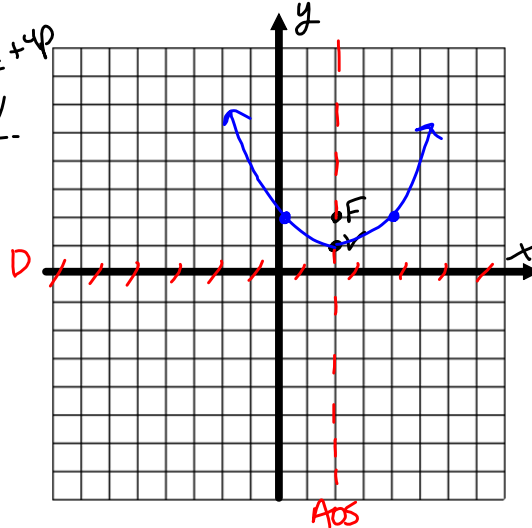
$p = 1$ V-F V-D

Vertex: $(2, 1)$

Focus: $(2, 2)$

Directrix: $y=0$

AOS: $x=2$



Aug 13-12:20 PM

2. $x^2 + 6x + 8y + 25 = 0$

$x^2 + 6x + \frac{9}{4} = -8y - 25 + \frac{9}{4}$

$(x+3)^2 = -8y - 16$

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

$x^2 = -4p$

Solve for y: $-\frac{1}{8}(x+3)^2 = (y+2) \left(\frac{1}{8}\right)$

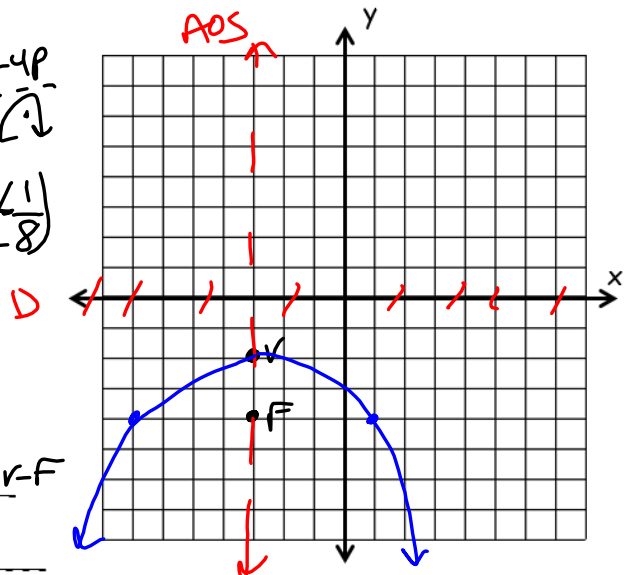
$y+2 = -\frac{1}{8}(x+3)^2$

$y = -\frac{1}{8}(x+3)^2 - 2$

$|4p| = 8$ (width) $p = 2$ V-D, V-F

Vertex: $(-3, -2)$ Focus: $(-3, -4)$

Directrix: $y=0$ AOS: $x=-3$



3. Find the solutions to the nearest ~~tenth~~ ^{hundredth} using your graphing calculator. Include a sketch with labeled points of intersection and the window you used to see the graph including all points of intersection.

$$y_1 = -4x^2 - 7x + 3$$

$$y_2 = 5x - 11$$

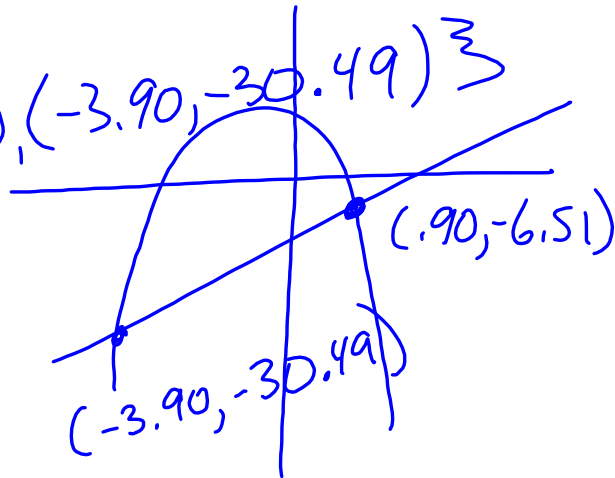
Solution:

$$\{(.90, -6.51), (-3.90, -30.49)\}$$

Window:

$$X_{\min} \underline{-10} \quad Y_{\min} \underline{-40}$$

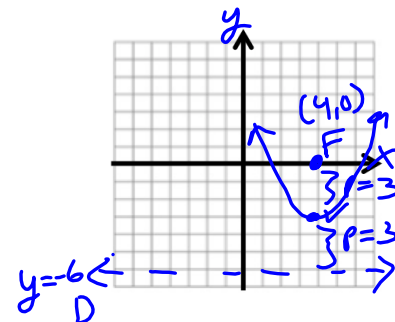
$$X_{\max} \underline{10} \quad Y_{\max} \underline{10}$$



4. The directrix of the parabola $12(y + 3) = (x - 4)^2$ has the equation $y = -6$. Find the coordinates of the focus of the parabola. (from the A2CC Regents exam, 6/16)

$$(x-4)^2 = 12(y+3)$$

Focus Pt $(4,0)$
Vertex $(4, -3)$
 $4p = 12$
 $p = 3$



5. Write the equation in vertex form ^(a) then ^(b) solve for y.

$$(a) \quad x^2 - 4x - 16y - 12 = 0$$

$$x^2 - 4x + 4 = 16y + 12 + 4$$

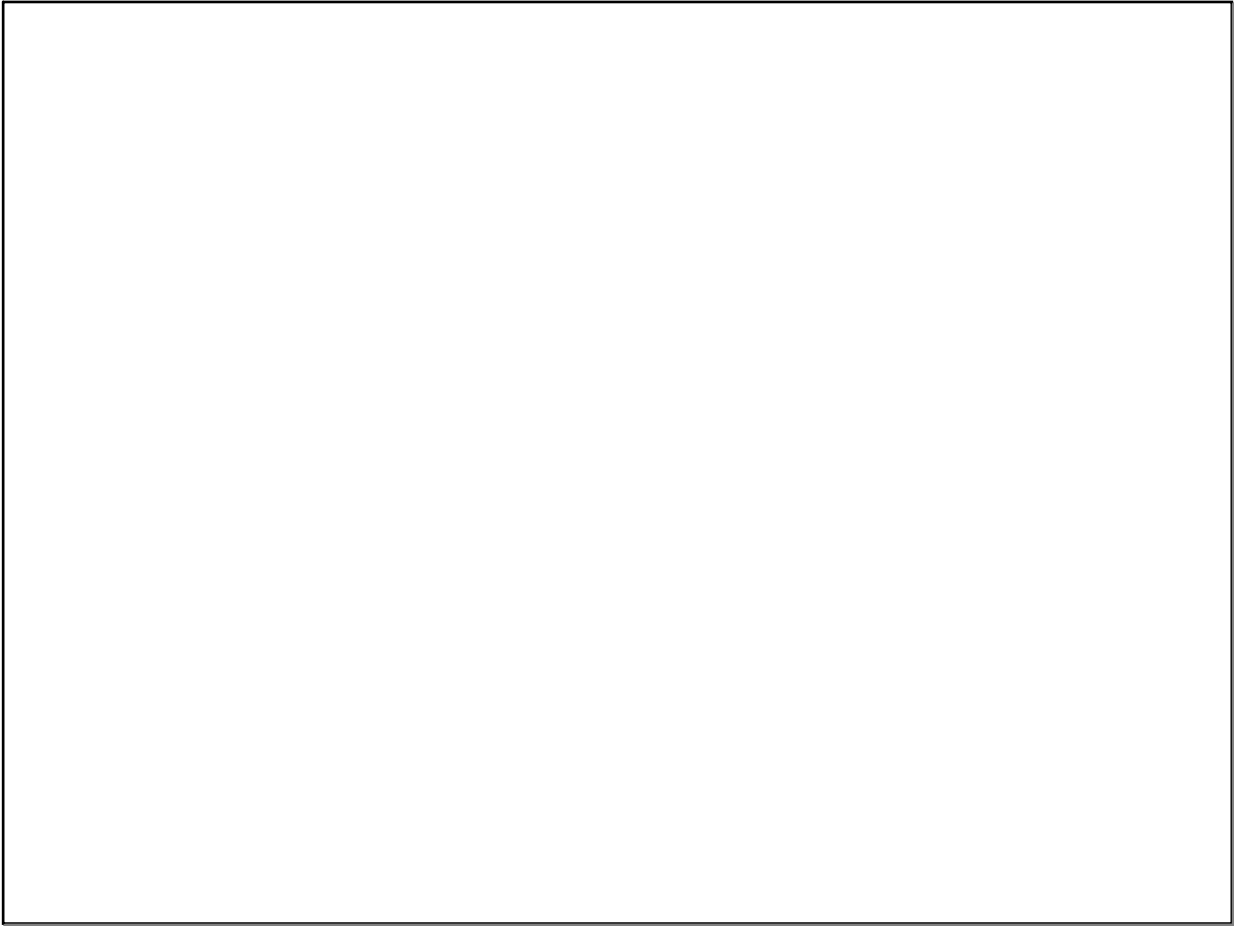
$$(x-2)^2 = 16y + 16$$

$$(x-2)^2 = 16(y+1)$$

$$\frac{1}{16}((x-2)^2) = \frac{1}{16}(16(y+1)) \quad \downarrow$$

$$y+1 = \frac{1}{16}(x-2)^2$$

$$y = \frac{1}{16}(x-2)^2 - 1$$



Sep 13-4:26 PM