

HW 3 - 4: Answers1. $\{(-1, 3), (-3, -1)\}$ 4. $\{(4, 3), (-4, -3)\}$ 6. $x = 2, y = -2, z = 3$

Aug 13-9:18 AM

In 1 & 2: Solve graphically:

$$\textcircled{1} y = 2x + 5$$

$$\textcircled{2} x^2 + y^2 - 4x + 2y - 20 = 0$$

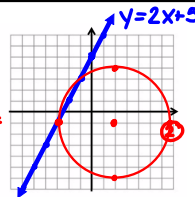
$$m = 2, b = 5$$

$$x^2 - 4x + 4 + y^2 + 2y + 1 = 20 + 4 + 1$$

$$(x-2)^2 + (y+1)^2 = 25$$

center: $(2, -1)$

radius: 5

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

Sep 9-9:32 PM

4. $x^2 + y^2 = 25$

$y = \frac{3}{4}x$

$x^2 + \left(\frac{3}{4}x\right)^2 = 25$

$x^2 + \frac{9}{16}x^2 = 25$

$\frac{25}{16}x^2 = 25$

$x^2 = 16$

$x = \pm 4$

$x = 4$

$y = \frac{3}{4}(4)$

$y = 3$

$x = -4$

$y = \frac{3}{4}(-4)$

$y = -3$

$\{(4, 3), (-4, -3)\}$

Sep 9-9:33 PM

$\textcircled{1} 3x - y + z = 11 \rightarrow \cdot 2 \Rightarrow 6x - 2y + 2z = 22$

$\textcircled{2} x + 4y - 2z = -12$

$\textcircled{3} 2x + 2y - z = -3$

$3x - y + z = 11$

$2x + 2y - z = -3$

$5x + y = 8$

$6x - 2y + 2z = 22$

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

$7x + 2y = 10$

$-2(5x + y = 8)$

$7x + 2y = 10$

$-10x - 2y = -16$

$7x + 2y = 10$

$-3x = -6$

$x = 2$

$7(2) + 2y = 10$

$2y = -4$

$y = -2$

$3(2) + 2 + z = 11$

$z = 3$

$x = 2$

$y = -2$

$z = 3$

Sep 9-9:33 PM

U3D6

Parabolas

Parabola → The set of all points equidistant from a fixed point (focus) and a fixed line (directrix)

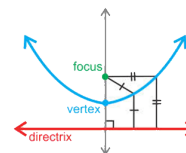
The focus is always inside the curve of the parabola.

The graph will always bend away from the directrix.

The vertex will always be on the parabola - right in the middle.

The axis of symmetry connects the focus and the vertex.

This is true no matter which way the parabola opens.



Aug 13-9:09 AM

Aug 13-11:33 AM

Equation (Standard Form):

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

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

Vertex (h, k)

$p > 0$

$x^2 = 4py$

focus $(0, p)$

vertex $(0, 0)$

directrix $y = -p$

$p < 0$

directrix $y = -p$

vertex $(0, 0)$

focus $(0, p)$

$p > 0$

$y^2 = 4px$

focus $(p, 0)$

vertex $(0, 0)$

directrix $x = -p$

$p < 0$

focus $(p, 0)$

vertex $(0, 0)$

directrix $x = -p$

Aug 13-11:33 AM

For each of the images given, determine a possible equation for the parabola. Label the focus (F), vertex (V), directrix ($y =$ or $x =$) and axis of symmetry ($y =$ or $x =$).

Aug 13-11:35 AM

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

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

$|4p| = 8$ width use the focus

$p = 2$ $4p = 8$

Vertex: $(-1, 2)$

Focus: $(1, 2)$

Directrix: $x = -3$

AOS: $y = 2$

distance of p units from the vertex

Aug 13-11:35 AM

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

$|4p| = 4$

$p = -1$ $4p = -4$

Vertex: $(1, -3)$

Focus: $(1, -4)$

Directrix: $y = -2$

AOS: $x = 1$

Aug 13-11:36 AM

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

$|4p| = 2$

$p = -1/2$ $4p = -2$

Vertex: $(3, -2)$

Focus: _____

Directrix: _____

AOS: _____

Aug 13-11:36 AM

Oct 18-7:25 AM