

## Graphing Systems of Inequalities

**Ex 3** Graph the solution set of the system

$$\textcircled{a} \quad x > 6 - 2y \rightarrow \frac{x}{-2} > \frac{6 - 2y}{-2}$$

$$\frac{x^2}{2} < \frac{2y}{2}$$

$$\frac{1}{2}x^2 < y$$

$$y > \frac{1}{2}x^2$$

x	$\frac{1}{2}x^2$	
-2	$\frac{1}{2}(-2)^2 = \frac{1}{2}(4) = 2$	
-1	$\frac{1}{2}$	Dash/Solid
0	0	
2	2	Above/Below

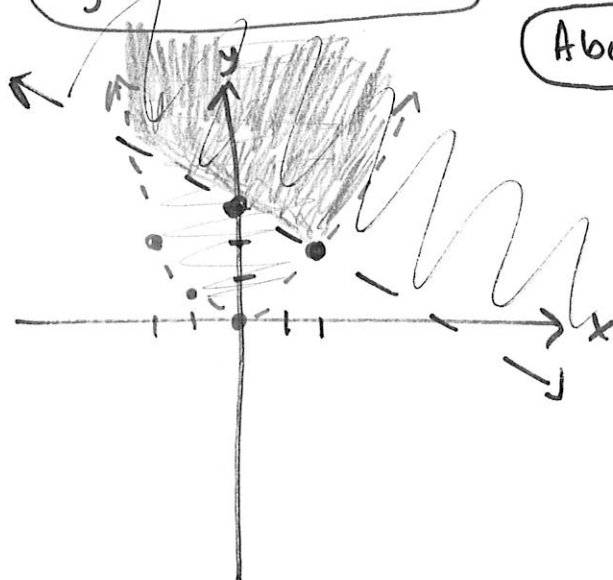
$$\frac{x-6}{-2} > \frac{-2y}{-2}$$

$$-\frac{1}{2}x + 3 < y$$

$$y > -\frac{1}{2}x + 3$$

Dash/Solid

Above/Below



Intersection points

(2, 2) from graph/table

$$y > \frac{1}{2}x^2$$

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

$$y > -\frac{1}{2}x + 3$$

$$+\frac{1}{2}x - 3 \quad +\frac{1}{2}x - 3$$

$$2\left(\frac{1}{2}x^2 + \frac{1}{2}x - 3 = 0\right)$$

$$x^2 + x - 6 = 0$$

$$(x+3)(x-2) = 0$$

$$\begin{array}{r|l} -6 & 1 \\ 3(-2) & 3-2=1 \end{array}$$

$$(x+3)(x-2) = 0$$

$$x+3 = 0$$

$$\begin{array}{r} -3 \quad -3 \\ \hline x = -3 \end{array}$$

$$x-2 = 0$$

$$\begin{array}{r} +2 \quad +2 \\ \hline x = 2 \end{array}$$

$$\begin{array}{r} x = 6 - 2y \\ 2 = 6 - 2y \\ -6 \quad -6 \\ \hline \end{array}$$

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

$$2 = y$$

$$\begin{array}{r} -3 = 6 - 2y \\ -6 \quad -6 \\ \hline \end{array}$$

$$\begin{array}{r} -9 = -2y \\ -2 \quad -2 \\ \hline \end{array}$$

$$\frac{9}{2} = y$$

$$4.5 = y$$

$$(2, 2)$$

$$(-3, 4.5)$$

Circle:  $(x-h)^2 + (y-k)^2 = r^2$

center  $(h, k)$

radius  $r$

**Ex**

$$(x-2)^2 + (y+3)^2 = 9$$

center  $(2, -3)$

$$r = 3$$

