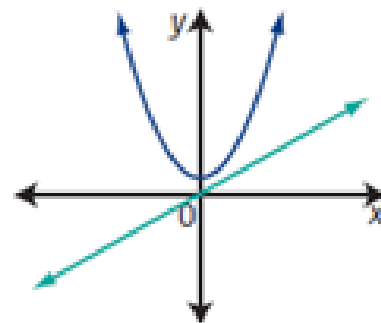


# 8.1

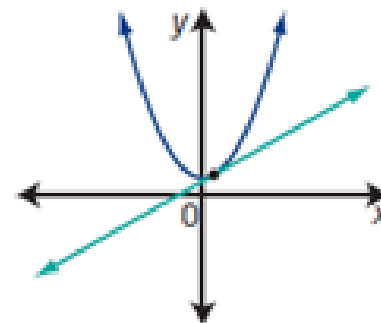
## Solving Systems of Equations Graphically

### system of linear-quadratic equations

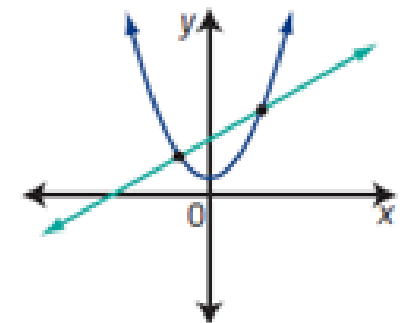
- a linear equation and a quadratic equation involving the same variables
- a graph of the system involves a line and a parabola



No point of intersection  
No solution



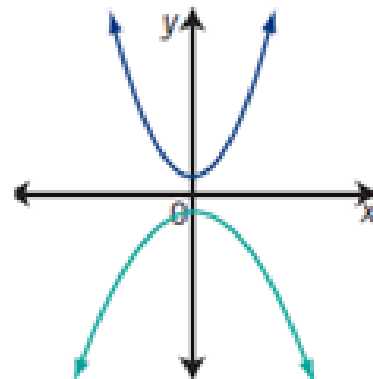
One point of intersection  
One solution



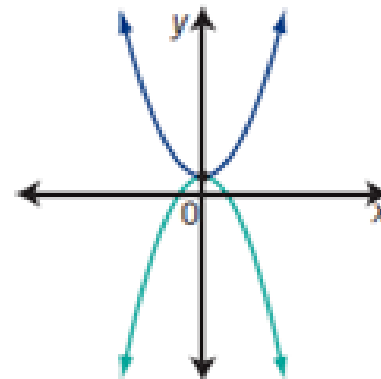
Two points of intersection  
Two solutions

### system of quadratic-quadratic equations

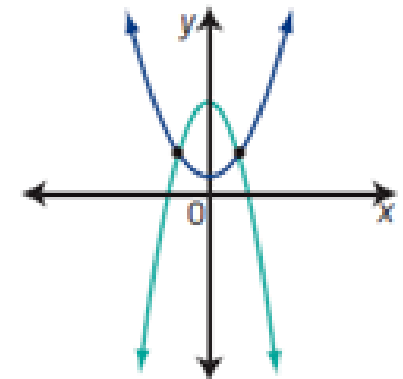
- two quadratic equations involving the same variables
- the graph involves two parabolas



No point of intersection  
No solution



One point of intersection  
One solution



Two points of intersection  
Two solutions

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### Example 2

#### Solve a System of Linear-Quadratic Equations Graphically

a) Solve the following system of equations graphically:

$$4x - y + 3 = 0$$

$$2x^2 + 8x - y + 3 = 0$$

b) Verify your solution.

$$Y_1: 4x - y + 3 = 0$$

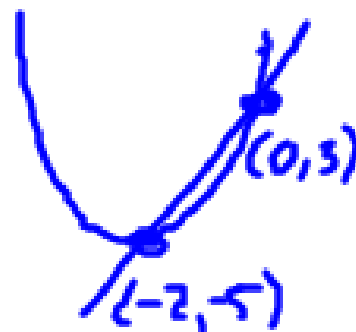
$$4x + 3 = y$$

$$Y_1 = 4x + 3$$

$$Y_2: 2x^2 + 8x - y + 3 = 0$$

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

$$Y_2 = 2x^2 + 8x + 3$$



$$x_{\min} = -8$$

$$x_{\max} = 5$$

$$y_{\min} = -8$$

$$y_{\max} = 5$$

calc intersect.

page 428

## Example 2

### Solve a System of Linear-Quadratic Equations Graphically

a) Solve the following system of equations graphically:

$$4x - y + 3 = 0$$

$$2x^2 + 8x - y + 3 = 0$$

b) Verify your solution.

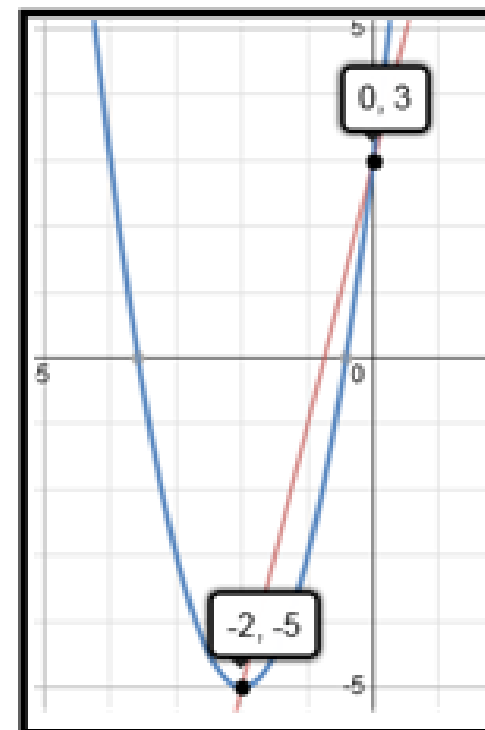
desmos.com



$$4x - y + 3 = 0$$



$$2x^2 + 8x - y + 3 = 0$$



Example 3 page 429

Solve a System of Quadratic-Quadratic Equations Graphically

a) Solve:

$$2x^2 - 16x - y = -35$$

$$2x^2 - 8x - y = -11$$

b) Verify your solution.

$$2x^2 - 16x - y = -35$$

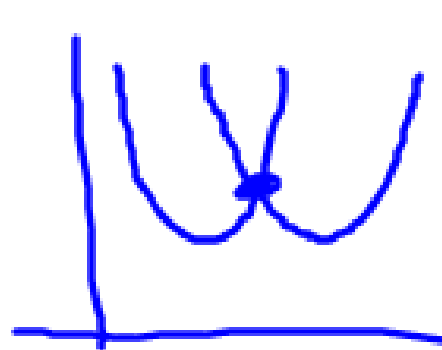
$$2x^2 - 16x + 35 = y$$

$$y_1 = 2x^2 - 16x + 35$$

$$2x^2 - 8x - y = -11$$

$$2x^2 - 8x + 11 = y$$

$$y_2 = 2x^2 - 8x + 11$$



$x_{\min} 0$   
 $x_{\max} 10$   
 $y_{\min} 0$   
 $y_{\max} 10$

calc intersect (3,5)

Example 4 page 430

Apply a System of Linear-Quadratic Equations

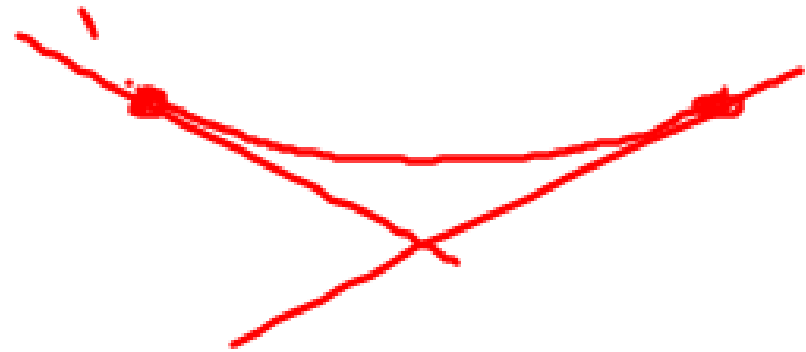


the linear equation  $y = -0.06x + 2.6$ , the se  
linear equation  $y = 0.09x + 2.35$ , and the p  
quadratic equation  $y = 0.0045x^2 + 2.8$ .

$$y_1 = -0.06x + 2.6$$

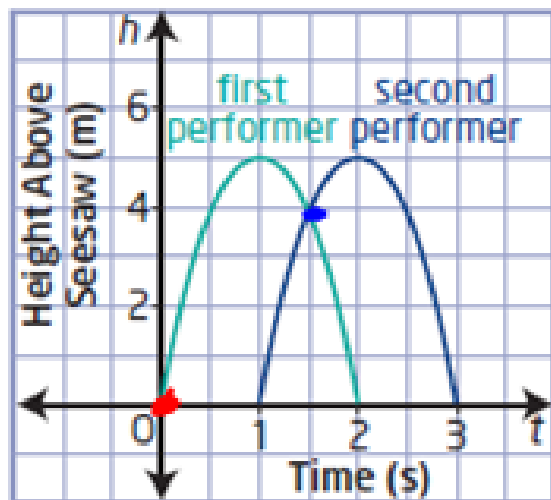
$$y_2 = 0.09x + 2.35$$

$$y_3 = 0.0045x^2 + 2.8$$



Example 5 page 432

Model a Situation Using a System of Equations



- Determine the system of equations that models the performers' height during the stunt.
- Solve the system graphically using technology.

first performer  $(0,0) \rightarrow (2,0)$   
 $(1,5)$  vertex

Equation  $y = a(x-1)^2 + 5$   
 $0 = a(-1)^2 + 5$   $(0,0)$

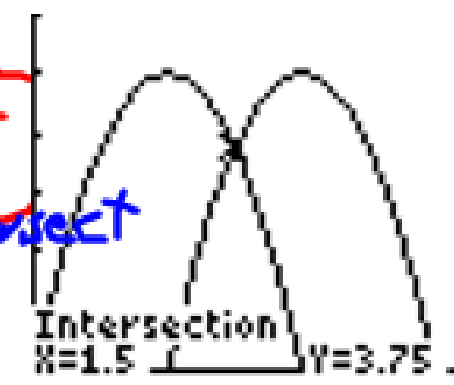
$-5 = 1a$   
 $y_1 = -5(x-1)^2 + 5$

2<sup>nd</sup> performer  
 $(1,0) \rightarrow (3,0)$   
 vertex  $(2,5)$

$y = a(x-2)^2 + 5$   $(1,0)$   
 $0 = a(1-2)^2 + 5$   
 $-5 = a$

$y_2 = -5(x-2)^2 + 5$

calc intersect  
 $(1.5, 3.75)$



1-7 pgs 435-436