Topic: Quadratic-Linear Systems

No Solution	One Solution	Two Solutions
$y = x^2 + 2x + 1$ $y = x - 4$	$y = x^2 + 2x + 1$ $y = x + \frac{3}{4}$	$y = x^2 + 2x + 1$ $y = x + 4$

Tangent Point

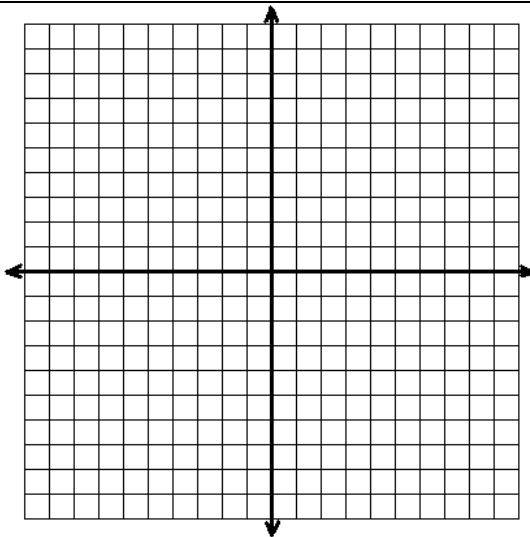## Model Graph each system and state the solution(s).

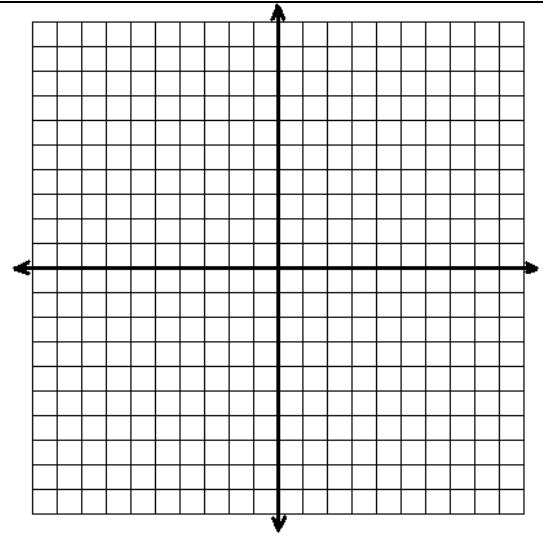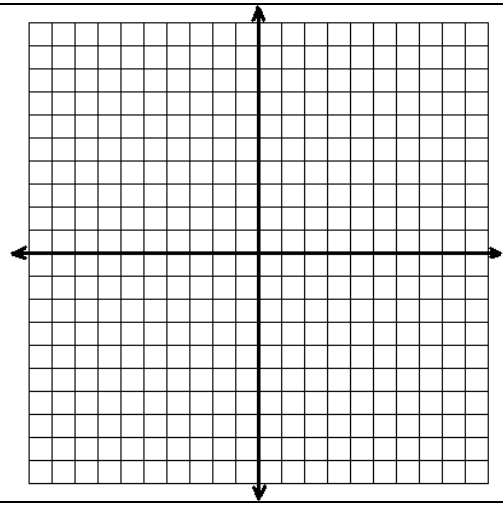| $Y = x^2 - 2x + 1$ $Y = -x + 3$ Solution(s): _____		$Y = x^2 - 2x + 1$ $Y = -2x + 1$ Solution(s): _____	

$Y = x^2 - 2x + 1$

$Y = -x - 3$

Solution(s): _____

Model   Solve the Quadratic-Linear Systems Algebraically.

Solve each system and check your answer.

If $f(x) = x^2$ and $g(x) = x$, determine the value(s) of x that satisfy the equation $f(x) = g(x)$.

Solve the system of equations $y = -x^2 + 4x + 1$ and $y = -x + 5$

Solution(s): _____

Solution(s): _____

If $f(x) = x^2 - 2x - 8$ and $g(x) = \frac{1}{4}x - 1$, for which

value of x is $f(x) = g(x)$?

1) −1.75 and −1.438
2) −1.75 and 4
3) −1.438 and 0
4) 4 and 0

CFU   Think-Pair-Share

1) . Which coordinate pair is a solution to the following system?
$$y = x^2 + 2x - 2$$
$$y = x + 10$$

A. (4, 14)   B. (3, 13)   C. (2, 12)   D. (−3, 7)

2) The graphs of $y = x^2 - 3$ and $y = 3x - 4$ intersect at
approximately

1) (0.38,−2.85), only
2) (2.62,3.85), only
3) (0.38,−2.85) and (2.62,3.85)
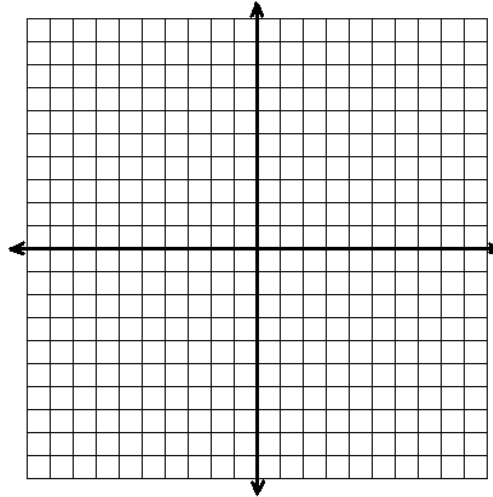4) (0.38,−2.85) and (3.85,2.62)

Independent Practice

The graphs of $y = x^2 - 3$ and $y = 3x - 4$ intersect at approximately
1) $(0.38, -2.85)$, only
2) $(2.62, 3.85)$, only
3) $(0.38, -2.85)$ and $(2.62, 3.85)$
4) $(0.38, -2.85)$ and $(3.85, 2.62)$

Let $f(x) = -2x^2$ and $g(x) = 2x - 4$. On the set of axes below, draw the graphs of $y = f(x)$ and $y = g(x)$.

Using this graph, determine and state *all* values of x for which $f(x) = g(x)$.

Solve each system by graphing. Find the number of solutions for each system.

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

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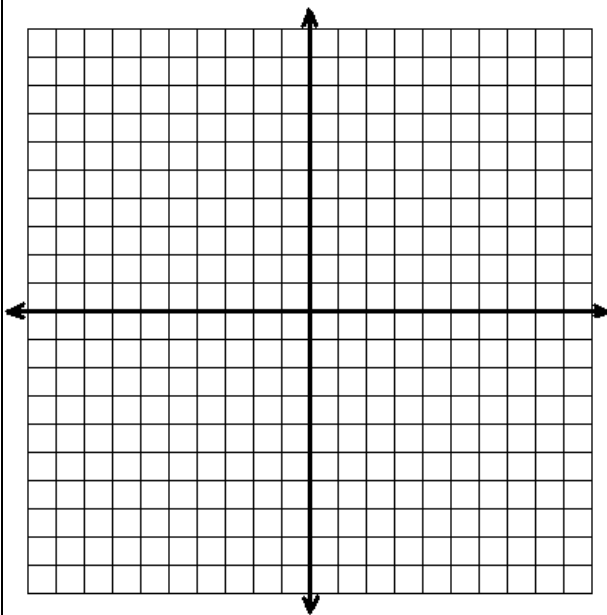
3. $y = x^2 - 5x - 4$
   $y = -2x$

4. $y = x^2 + 2x + 4$
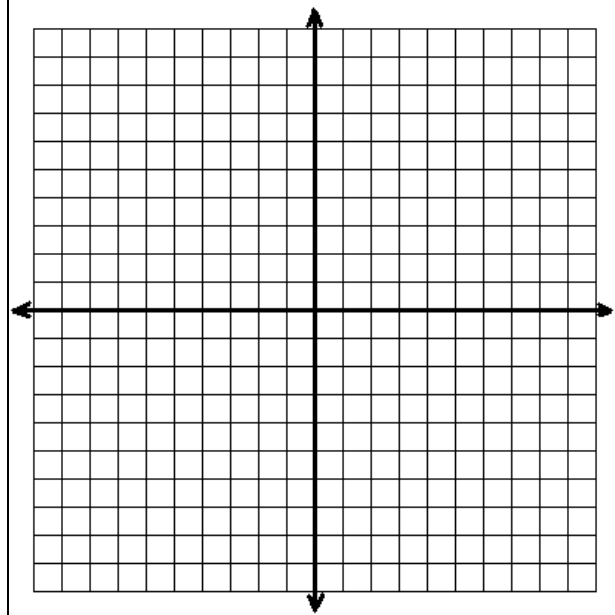 $y = x + 1$

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

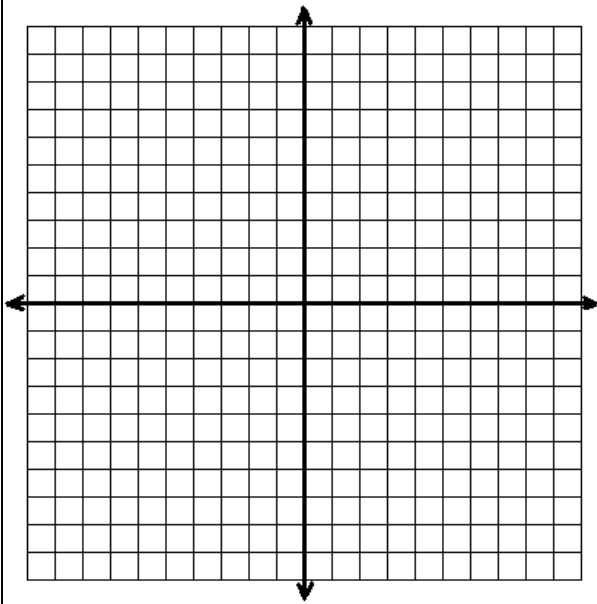6. $y = 3x + 4$
   $y = -x^2$
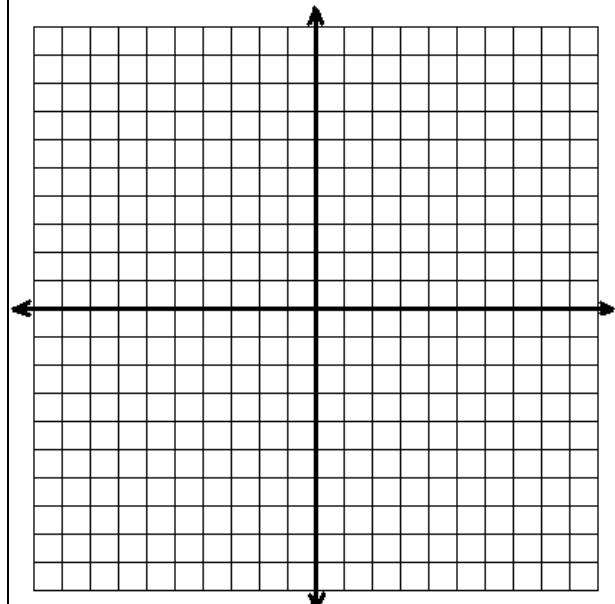
#1	#2

Solution(s): _____

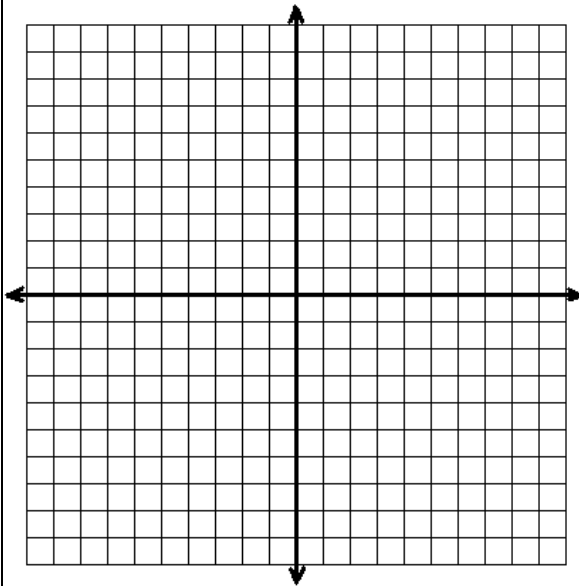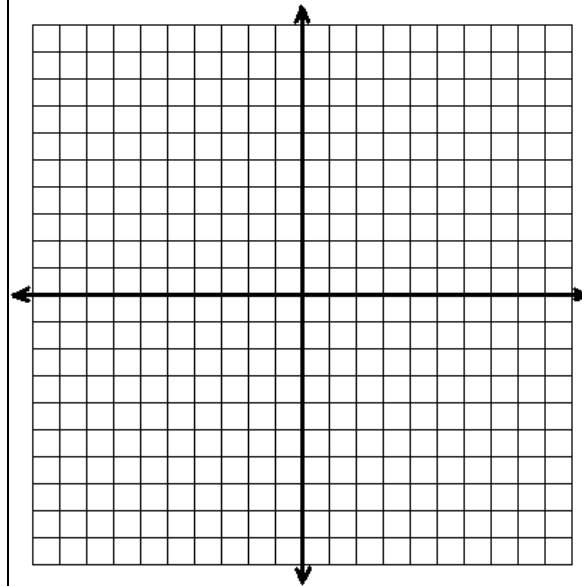Solution(s): _____

#3

#4

Solution(s):

_____

Solution(s): _____

#5

Solution(s): _____

#6

Solution(s): _____

A company is considering building a manufacturing plant. They determine the weekly production cost at site A to be $A(x) = 3x^2$ while the production cost at site B is $B(x) = 8x + 3$, where x represents the number of products, *in hundreds*, and $A(x)$ and $B(x)$ are the production costs, *in hundreds of dollars*. Graph the production cost functions on the set of axes below and label them site A and site B.
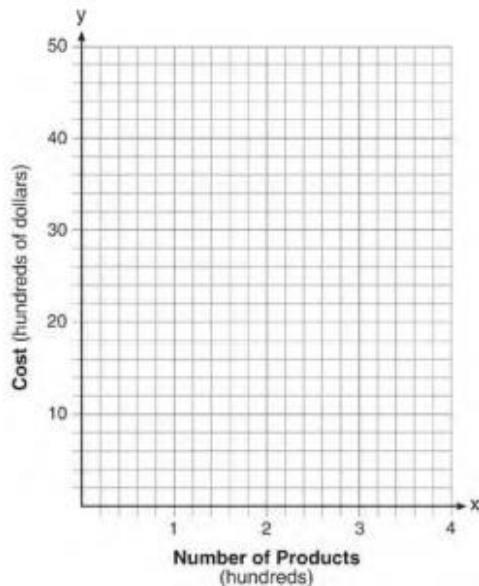
State the positive value(s) of x for which the production costs at the two sites are equal. Explain how you determined your answer. If the company plans on manufacturing 200 products per week, which site should they use? Justify your answer.