

Chapter 2.5 Check Your Understanding

Exercises 1–5 True or False. Give reasons.

1. If we translate the graph of $y = x^2$ two units to the right and one unit down, the result will be the graph of $y = x^2 - 4x + 3$.

Answer:

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

2. The y -intercept point for the graph of $y = x^2 + x - 3$ is above the x -axis.

Answer:

False; the y -intercept point is $(0, -3)$, below the x -axis.

3. The maximum value of $f(x) = 15 - 2x - x^2$ is 12.

Answer:

False; the vertex is $(-1, 16)$, so the maximum value is 16.

4. The graphs of $y = x^2 - 5x - 4$ and $y = 8 + 3x - x^2$ intersect at points in Quadrants II and IV.

Answer:

True; draw graphs of $y_1 = x^2 - 5x - 4$ and $y_2 = 8 + 3x - x^2$.

5. If we translate the graph of $y = x^2$ three units down it will be the graph of $y = 2x^2 - 6$.

Answer:

False; Check $x = 0$. $y = 2(0)^2 - 6 = -6$ which is 6 units down, not 3.

Exercises 6–8 Fill in the blank so that the resulting statement is true. The number of points at which the two graphs intersect is _____.

6. $f(x) = x^2 - 5x - 5$, $g(x) = 8 + 3x - x^2$

Answer:

Draw graphs of $y = x^2 - 5x - 5$ and $y_2 = 8 + 3x - x^2$.

7. $f(x) = 3 + 3x - x^2$, $g(x) = 8 - x$

Answer:

The graphs intersect at no points.

8. $f(x) = 3 + 3x - x^2, g(x) = |x - 2| - 2x$

Answer:

The graphs intersect at two points.

Exercises 9–10 Draw a graph of function f using a $[-10, 10]$ by $[-10, 10]$ window. The number of x -intercept points visible in this window is .

9. $f(x) = 0.3x^2 - 4x - 1$

Answer:

The graphs intersect at one point.

10. $f(x) = 3 - 3x - 0.3x^2$

Answer:

Only one x -intercept is visible in the window but we know there are two.