

Chapter 9.4 Check Your Understanding

Exercises 1–6 True or False. Give reasons.

1. The point $(-1, 2)$ is in the solution set for $2x + 3y < 4$.

Answer:

False; replace x by -1 and y by 2 and get $-2 + 6 < 4$, which is false.

2. The solution set for the system $x < 0, y > 0, x + y > 1$ contains only points in the second quadrant.

Answer:

True; draw a diagram.

3. The solution set for the system $x < 0, y > 0, x + y > 1$ is the empty set.

Answer:

False; the solution set contains points in QII.

4. The solution set for the system $x < 0, x - y > 1$ contains points in the third quadrant only.

Answer:

True; draw a diagram.

5. The solution set for the system $x < 1, y < x$ contains no points in the fourth quadrant.

Answer:

False; draw a graph and see that the solution set contains points in the first and third quadrants as well as the fourth quadrant.

6. Point $(2, -3)$ is a corner point for the system of inequalities, $2x + 3y \leq -5, 3x - y \geq 9, x - y \leq 1$.

Answer:

True; point $(2, -3)$ is on both lines $2x + 3y = -5$ and $3x - y = 9$.

Exercises 7–10 Fill in the blank with the quadrant(s) that make the resulting statement true.

7. The solution set for $y > x + 2$ contains no points in _____.

Answer:

The points (x, y) that satisfy $y > x + 2$ are all those above the line $y = x + 2$. This set contains no points in QIV.

8. The solution set for $y \geq 2x + 1$ contains points in _____.

Answer:

The points (x, y) that satisfy $y \geq 2x + 1$ are all points on or above the line $y = 2x + 1$. This set contains points in QI, QII, and QIII.

9. The solution set for the system $y \geq x, y \leq -x$ contains points in _____.

Answer:

Draw a graph showing the solution set for $y \geq x$ and $y \leq -x$. This set contains points in QII and QIII.

10. The expression $\sqrt{x - y - 2}$ is a real number for some points (x, y) in _____.

Answer:

$x - y - 2 = 0, y \leq x - 2$. Draw a graph showing all points satisfying $y \leq x - 2$. that is, all points on or below the line $y = x - 2$. This set contains points in QI, QIII, and QIV.