NAME _____ DATE _____ PERIOD _____

6-3 Study Guide and Intervention

Square Root Functions and Inequalities

Square Root Functions A function that contains the square root of a variable expression is a **square root function**. The domain of a square root function is those values for which the radicand is greater than or equal to 0.

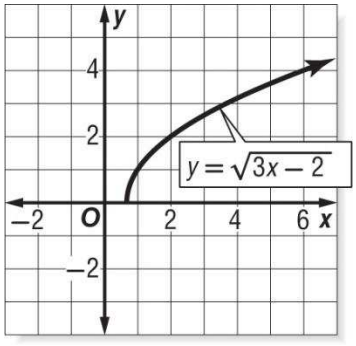
Example: Graph $y = \sqrt{3x - 2}$. State its domain and range.

Since the radicand cannot be negative, the domain of the function is $3x - 2 \geq 0$ or $x \geq \frac{2}{3}$.

The x-intercept is $\frac{2}{3}$. The range is $y \geq 0$.

Make a table of values and graph the function.

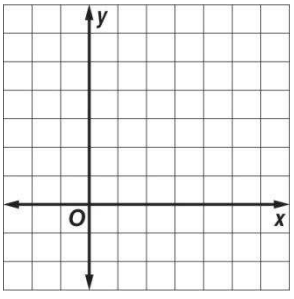
x	y
$\frac{2}{3}$	0
1	1
2	2
3	$\sqrt{7}$



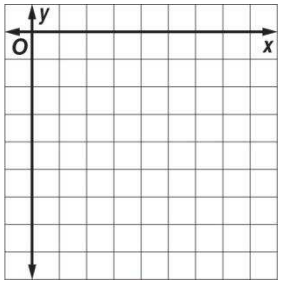
Exercises

Graph each function. State the domain and range.

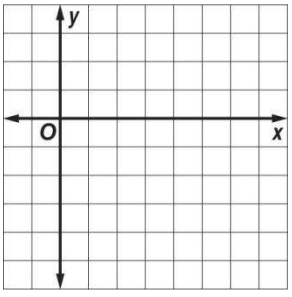
1. $y = \sqrt{2x}$



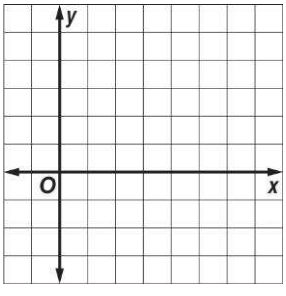
2. $y = -3\sqrt{x}$



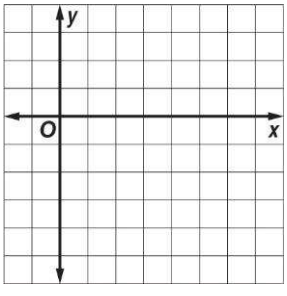
3. $y = -\sqrt{\frac{x}{2}}$



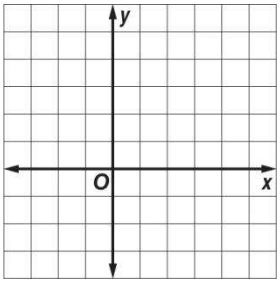
4. $y = 2\sqrt{x - 3}$



5. $y = -\sqrt{2x - 3}$



6. $y = \sqrt{2x + 5}$



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6-3 Study Guide and Intervention *(continued)*

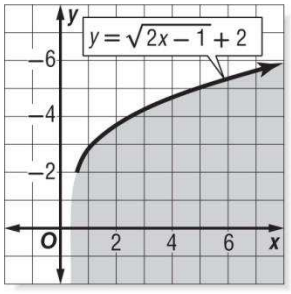
Square Root Functions and Inequalities

Square Root Inequalities A **square root inequality** is an inequality that contains the square root of a variable expression. Use what you know about graphing square root functions and graphing inequalities to graph square root inequalities.

Example: Graph $y \leq \sqrt{2x-1} + 2$.

Graph the related equation $y = \sqrt{2x-1} + 2$. Since the boundary should be included, the graph should be solid.

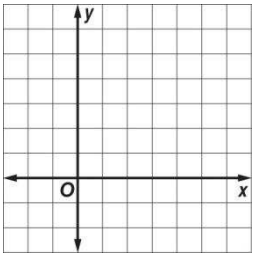
The domain includes values for $x \geq \frac{1}{2}$, so the graph is to the right of $x = \frac{1}{2}$.



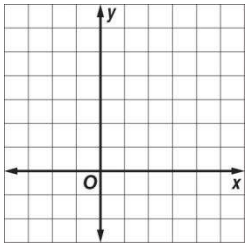
Exercises

Graph each inequality.

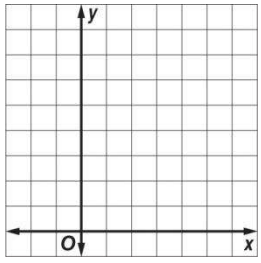
1. $y < 2\sqrt{x}$



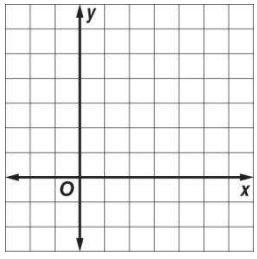
2. $y > \sqrt{x+3}$



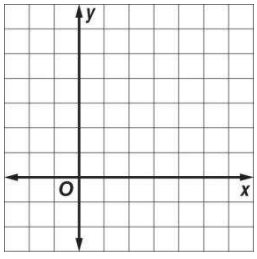
3. $y < 3\sqrt{2x-1}$



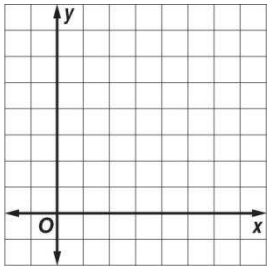
4. $y < \sqrt{3x-4}$



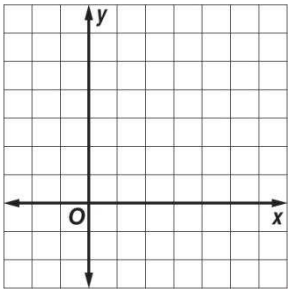
5. $y \geq \sqrt{x+1} - 4$



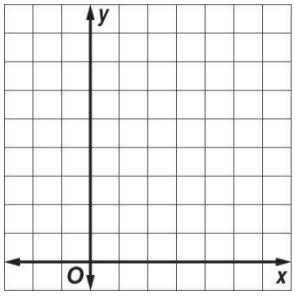
6. $y > 2\sqrt{2x-3}$



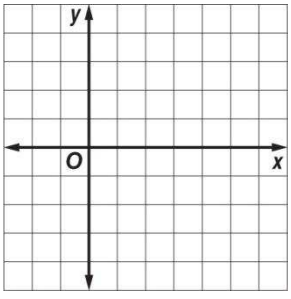
7. $y \geq \sqrt{3x+1} - 2$



8. $y \leq \sqrt{4x-2} + 1$



9. $y < 2\sqrt{2x-1} - 4$



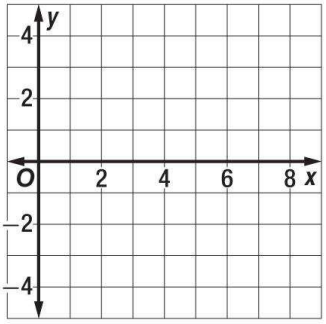
NAME _____ DATE _____ PERIOD _____

6-3 Skills Practice

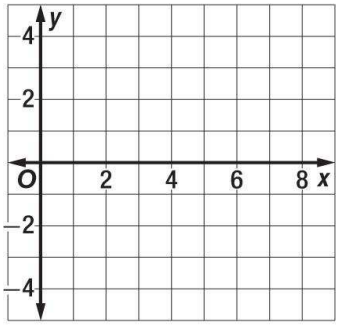
Square Root Functions and Inequalities

Graph each function. State the domain and range of each function.

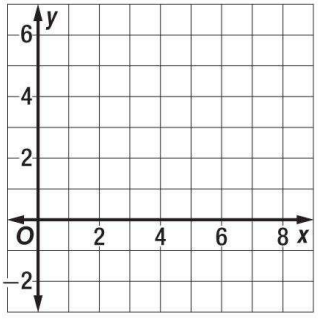
1. $y = \sqrt{2x}$



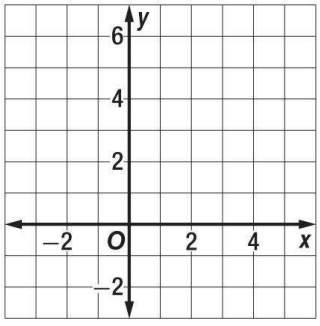
2. $y = -\sqrt{3x}$



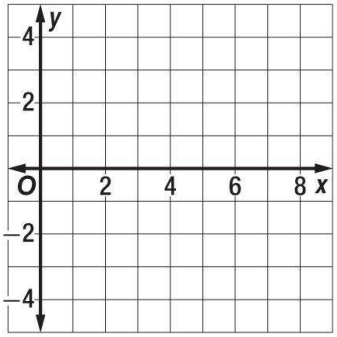
3. $y = 2\sqrt{x}$



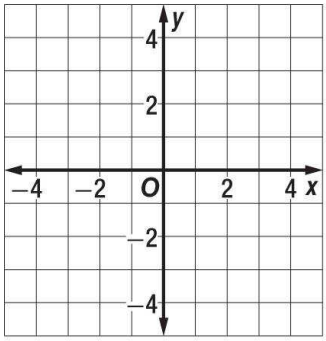
4. $y = \sqrt{x + 3}$



5. $y = -\sqrt{2x - 5}$

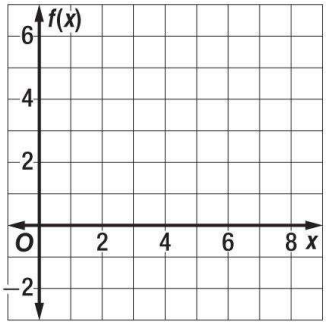


6. $y = \sqrt{x + 4} - 2$

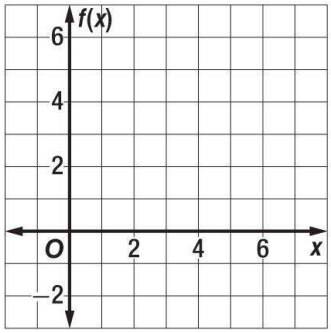


Graph each inequality.

7. $f(x) < \sqrt{4x}$



8. $f(x) \geq \sqrt{x + 1}$



9. $f(x) \leq \sqrt{4x - 3}$