Solve, write your answer in interval notation and graph the solution set.

2b. $7 + |3y - 2|$ less than or equal to 10

2c. $|6x + 5|$ greater than or equal to -5

Solution

Inequalities involving absolute values can be rewritten as combinations of inequalities. Let y be a positive number, then $7 + 3y - 2 \leq 10$

$7 + 3y - 2 \leq 10$

$3y \leq 10 - 5$

$3y \leq 5$

$y \leq \frac{5}{3}$

Let y be a positive number, then $7 - 3y + 2 \leq 10$

$-3y + 9 \leq 10$

$-3y \leq 1$

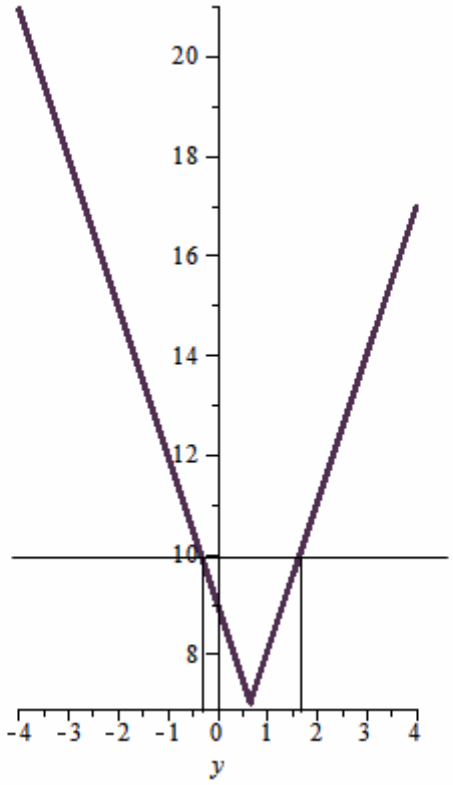
When we divided both sides of the inequality by -3 we changed the direction of the inequality.

$y \geq -\frac{1}{3}$

$-\frac{1}{3} \leq y \leq \frac{5}{3}$

The absolute value of a number is the distance the number is from 0 on the number line. So the inequality $|3y - 2| < 10$ is satisfied by numbers whose distance from 0 is less than or equal to 10. This is the set of numbers between -10 and 10. In terms of graphs, we are looking for y values such that the corresponding point on the graph of $7 + |3y - 2|$ is either below or equal to the point on the graph of 10.

Interval notation for closed interval $y \in [-\frac{1}{3}, \frac{5}{3}]$



2c. $|6x + 5|$ greater than or equal to -5

$|6x + 5| \geq -5$

Let x be a positive number, then $6x + 5 \geq -5$.

$6x \geq 0$

$x \geq 0$

$x \in R$