Algebra II Worksheet #3 Unit 1 selected solutions page 1

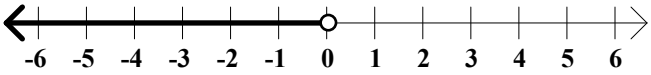
For each of the following graphs, (a) write an appropriate inequality and (b) represent the graph using interval notation.

1. (a) $\mathbf{-5 \le x \le 1}$

   (b) **[-5 , 1]**

3. (a) $\mathbf{x < 0}$

   (b) **(-∞ , 0)**



For each of the following intervals, (a) write an appropriate inequality, (b) tell whether it is bounded or unbounded, and (c) sketch its graph.

5. [-2 , 3]

(a) $\mathbf{-2 \le x \le 3}$

(b) **bounded**

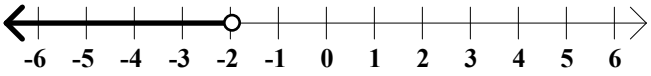
(c)

8. (-∞ , -2)

(a) $\mathbf{x < -2}$

(b) **unbounded**

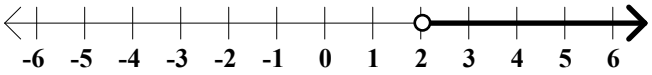
(c)



Solve each of the following inequalities. Then express the solution set using interval notation and sketch its graph. (Show your work neatly organized.)

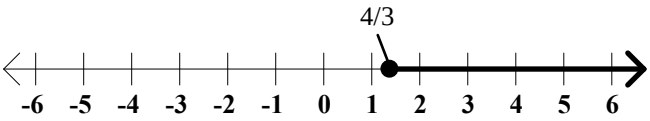
9. $\mathbf{3(2x - 5) - 5(3x - 7) < 2}$

$$\mathbf{6x - 15 - 15x + 35 < 2}$$
$$\mathbf{-9x + 20 < 2}$$
$$\mathbf{-9x < -18}$$
$$\mathbf{x > 2}$$
$$\mathbf{S = (2 , \infty)}$$



11. $\mathbf{2(5x - 1) + 3(x - 5) \ge 6(3x - 2) - 5(4x - 3)}$

$$\mathbf{10x - 2 + 3x - 15 \ge 18x - 12 - 20x + 15}$$
$$\mathbf{13x - 17 \ge -2x + 3}$$
$$\mathbf{15x \ge 20}$$
$$\mathbf{x \ge 4/3}$$
$$\mathbf{S = [4/3 , \infty)}$$



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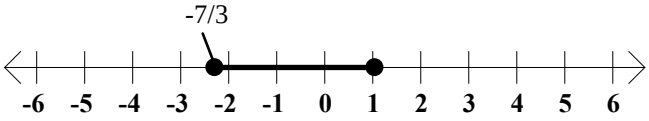
Solve each of the following inequalities. Then express the solution set using interval notation and sketch its graph. (Show your work neatly organized.)

13. $-5 \le 3x + 2 \le 5$

$-7 \le 3x \le 3$

$\frac{-7}{3} \le x \le 1$

$S = [\ -7/3\ ,\ 1\ ]$



15. $-2 < \frac{3x - 1}{5} < 1$

$-10 < 3x - 1 < 5$

$-9 < 3x < 6$

$-3 < x < 2$

$S = (\ -3\ ,\ 2\ )$

Express each of the following as a single interval.

17. $[\ -2\ ,\ 5\ ) \cap (\ 0\ ,\ 6\ ] = (\ 0\ ,\ 5\ )$

18. $[\ -2\ ,\ 5\ ) \cup (\ 0\ ,\ 6\ ] = [\ -2\ ,\ 6\ ]$

21. $[\ 0\ ,\ \infty\ ) \cap (\ -3\ ,\ \infty\ ) = [\ 0\ ,\ \infty\ )$

22. $[\ 0\ ,\ \infty\ ) \cup (\ -3\ ,\ \infty\ ) = (\ -3\ ,\ \infty\ )$