

NAME _____

DATE _____

Module Test A

Module 5

Solve and graph.

1. $x - 3 \geq -5$ $x \geq -2$



2. $-5 \geq x + 8$ $x \leq -13$



3. $-4x \geq 20$ $x \leq -5$



4. $-30 < 15x$ $x > -2$



5. $3x - 1 > 8$ $x > 3$



6. $5 - 4x \leq 21$ $x \geq -4$



7. $\frac{1}{2}x + 6 \leq 2$ $x \leq -8$



8. $-5x - 3 > 17$ $x < -4$



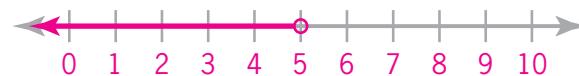
9. $x + 6 > 2x - 4$ $x < 10$



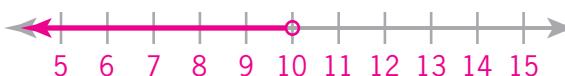
10. $-4x - 1 \leq -2x + 5$ $x \geq -3$



11. $3 - 4(x - 2) > -(3x - 6)$ $x < 5$



12. $-12 - (3 - 2x) > -7 + 3(x - 6)$ $x < 10$



13. $x < 4$ and $x > 6$ \emptyset



14. $x > 4$ or $x > 5$ $x > 4$



15. $x - 4 > 7$ or $x + 3 < 20$ \emptyset



16. $2x - 6 \leq -6$ and $x - 1 > -7$ $-6 < x \leq 0$



17. $-7 \leq 3x - 1 \leq 5$ $-2 \leq x \leq 2$



18. $\frac{4}{5}x - 4 \geq 12$ or $\frac{1}{3}x + 1 \geq -2$ $x \geq -9$



Write an inequality and solve it to answer each problem.

19. Rosalind scored 82 and 88 on her first two algebra tests. What must she score on her third test so her average score is above 85?

$$\frac{82 + 88 + x}{3} > 85; x > 85; \text{Rosalind must}$$

score better than 85 on the third test.

21. Consider the conjunction $-5 \leq \frac{1}{2}x - 4 < -\frac{5}{2}$.

- a. What two inequalities are shown by the conjunction?

$$\frac{1}{2}x - 4 \geq -5 \text{ or } -5 \leq \frac{1}{2}x - 4, \text{ and } \frac{1}{2}x - 4 < -\frac{5}{2}$$

- b. Solve each inequality from part a, showing all steps.

$$\begin{array}{rcl} \frac{1}{2}x - 4 \geq -5 & & \frac{1}{2}x - 4 < -\frac{5}{2} \\ +4 \quad +4 & & +4 \quad +4 \\ \hline 2\left(\frac{1}{2}x\right) \geq -1(2) & & 2\left(\frac{1}{2}x\right) < \frac{3}{2}(2) \\ x \geq -2 & \text{AND} & x < 3 \end{array}$$

20. Roberta earns a base salary of \$250 per week, plus a commission of 30% of her total sales. What must her total sales be if she wants to make more than \$500 this week?

$250 + 0.30s > 500; s > 833.333\dots$;
Rounding to the nearest hundredth greater than 833.333 you have 833.34. So Roberta's total sales must be \$833.34 or greater.

- c. Solve the conjunction $-5 \leq \frac{1}{2}x - 4 < -\frac{5}{2}$ by using inverse operations on all three parts.

$$\begin{array}{rcl} -5 & \leq & \frac{1}{2}x - 4 & < -\frac{5}{2} \\ +4 & & +4 & +4 \\ \hline -1 & \leq & \frac{1}{2}x & < \frac{3}{2} \\ -1(2) & \leq & (2)\frac{1}{2}x & < \frac{3}{2}(2) \\ -2 & \leq & x & < 3 \end{array}$$

- d. Explain why the solutions you found in parts b and c are equivalent. Use a graph to support your answer.

The conjunction $x \geq -2$ and $x < 3$ (the answer from part b) and the conjunction $-2 \leq x < 3$ (the answer from part c) are two different ways of stating the same solution set.



