

NAME _____

DATE _____

Module Test B

Module 5

Solve and graph.

1. $\frac{x}{4} < -2$ $x < -8$



2. $x - 6 \geq -4$ $x \geq 2$



3. $2x \geq 6$ $x \geq 3$



4. $0 \geq x - 4$ $x \leq 4$



5. $-2x - 4 \geq 6$ $x \leq -5$



6. $13 > \frac{2}{3}x + 15$ $x < -3$



7. $6 - 8x \geq 22$ $x \leq -2$



8. $-4x - 3 > -3$ $x < 0$



9. $4x - 2 > 3x$ $x > 2$



10. $6x - 5 \geq 3x + 13$ $x \geq 6$



13. $x > 5$ and $x > 7$ $x > 7$



14. $x < 0$ or $x > 0$ $x \neq 0$



15. $-2x > -4$ and $3x \geq 9$ \emptyset



16. $5x - 2 < 8$ or $-x - 1 < -2$ \Re



17. $\frac{3}{4}x - 1 \geq 5$ and $6 - \frac{1}{2}x \leq 1$ $x \geq 10$



18. $-12 \leq -4x - 4 \leq 20$ $-6 \leq x \leq 2$ or $2 \geq x \geq -6$



Write an inequality and solve it to answer each problem.

19. Oscar is going to join a gym. Big Muscles charges a \$75 initiation fee, plus a monthly fee of \$40. Buff Bodies charges a \$150 initiation fee, plus a \$25 monthly fee. For how many months must Oscar belong to Buff Bodies for it to be the less expensive choice?

$150 + 25x < 75 + 40x$; Oscar must belong to Buff Bodies for more than five months (i.e. 6 months or more).

21. Consider the conjunction $0 < 8 - 4x \leq 16$.

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

$8 - 4x > 0$ or $0 < 8 - 4x$ and $8 - 4x \leq 16$

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

$$\begin{array}{rcl} 8 - 4x > 0 & & 8 - 4x \leq 16 \\ -8 & & -8 \\ \hline -4x < -8 & & -4x \geq -8 \\ \hline x < 2 & & x \geq -2 \end{array}$$

AND

$x + (x + 1) + (x + 2) \geq 80$; $x > 25\frac{2}{3}$

The answer is 26, 27, and 28.

- c. Solve the conjunction $0 < 8 - 4x \leq 16$ by using inverse operations on all three parts.

$$\begin{array}{r} 0 < 8 - 4x \leq 16 \\ -8 \quad -8 \quad -8 \\ \hline -8 > -4x \geq -8 \\ -4 > x \geq -2 \\ -2 \leq x < 2 \end{array}$$

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

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



