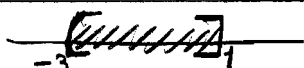

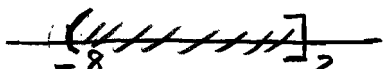
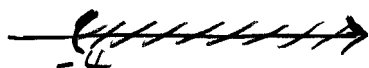

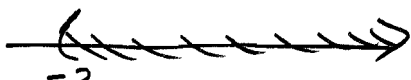
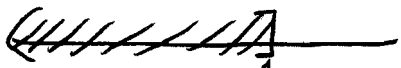


II. Intervals on the Number Line

5. A portion of the real number system is represented in each problem below by a geometric description, an inequality, or interval notation. Re-express each interval in the two alternative representations.

|     | Geometric Description   | Inequality         | Interval Notation |
|-----|---|--------------------|-------------------|
| (a) |    | $-3 \leq x \leq 1$ | $[-3, 1]$         |
| (b) |    | $0 < x < 5$        | $(0, 5)$          |
| (c) |    | $-8 < x \leq 2$    | $(-8, 2]$         |
| (d) |    | $x > -4$           | $(-4, \infty)$    |
| (e) |    | $x \leq 2$         | $(-\infty, 2]$    |
| (f) |    | $x > -3$           | $(-3, \infty)$    |
| (g) |  | $x \leq 1$         | $(-\infty, 1]$    |

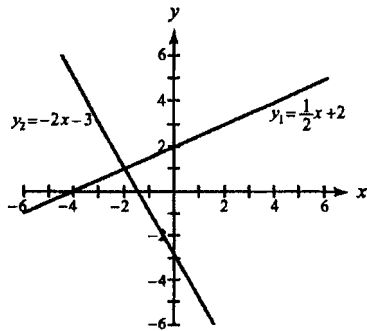
Chapter 3, Test Form B

1. Solve  $-2x+5=-7$ . Check your answer.

$$-2x = -12$$

$$x = 6$$

In #2 and #3, use the graph below.



2. Solve  $y_1 = y_2$ .

3. Solve  $y_1 \geq y_2$ . Write your answer in interval notation.

4. Solve  $3x+2=-2x+2$  graphically.

$$\begin{array}{r} +2x \quad +2x \\ 3x+2 = -2x+2 \\ \hline 5x = 0 \end{array} \Rightarrow x = 0$$

5. Solve  $3+4(x-2)=x+1$  symbolically.

$$3 + 4x - 8 = x + 1 \quad 3x = 6 \quad x = 2$$

In #6 and #7, translate the sentence into an equation and then solve the equation for  $x$ .

6. The difference between 2 times  $x$  and 3 is 2.

$$2x - 3 = 2 \quad 2x = 5 \quad x = \frac{5}{2}$$

7. If  $-4$  is added to 2 times  $x$ , it equals  $x$  plus 1.

$$-4 + 2x = x + 1 \quad x = 5$$

8. Solve  $4 - \frac{1}{2}x > x + 1$ . Write your answer in interval notation.

$$\begin{array}{r} 8 - x > 2x + 2 \\ -3x > -6 \\ x < 2 \end{array}$$

1.  $x = 6$

2.  $x = -2$

3.  $[-2, \infty)$

4.  $x = 0$

5.  $x = 2$

6.  $x = \frac{5}{2}$

7.  $x = 5$

8.  $(-\infty, 2)$

9. Solve  $2 - 3(x + 4) \geq 2x - 1$ . Write your answer in interval notation.

$$2 - 3x - 12 \geq 2x - 1$$

$$-5x \geq 9$$

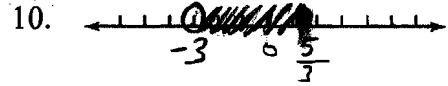
$$x \leq -\frac{9}{5}$$

9.  $(-\infty, -\frac{9}{5}]$

In #10 and #11, graph the solution set to the compound inequality on a number line.

10. Solve:  $3x - 1 \leq 4$  and  $2x > x - 3$ .

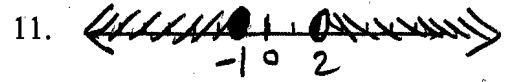
$$3x \leq 5 \quad x \leq \frac{5}{3} \quad x > -3$$



11. Solve:  $2x \leq x - 1$  or  $2x + 3 > 7$ .

$$x \leq -1 \text{ OR } 2x > 4$$

$$x > 2$$



12. Use the table to solve the compound inequality  $2 < 2x \leq 6$ . Write your answer in interval notation.

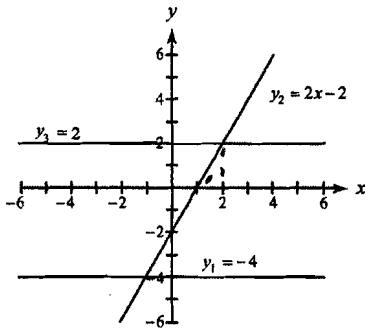
|    |    |    |    |   |   |   |   |
|----|----|----|----|---|---|---|---|
| x  | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| 2x | -6 | -4 | -2 | 0 | 2 | 4 | 6 |

$$2 < 2x \leq 6 \quad \text{Divide by 2}$$

$$1 < x \leq 3$$

12.  $(1, 3]$

In #13 and #14, use the graph below.



13. Solve:  $y_1 = y_2$ .

13.  $x = 2$

14. Solve:  $y_2 \leq y_3$ . Write your answer in interval notation.

$$2x - 2 \leq 2$$

$$2x \leq 4$$

$$x \leq 2$$

14.  $x \leq 2$

$(-\infty, 2]$

In #15 and #16, solve the compound inequality and write the solution set in interval notation.

15. Solve:  $-2 \leq 4 - \frac{1}{3}x < 3$ .

$$-6 \leq -\frac{1}{3}x < -1 \quad -18 \leq -x < -3$$

$$18 \geq x > 3$$

15.  $(3, 18]$

16. Solve:  $2 - \frac{2}{3}x \leq -4$  or  $2 - \frac{2}{3}x > -1$ .

$$-\frac{2}{3}x \leq -6 \quad -2x \leq -18 \quad -\frac{2}{3}x > -3$$

16.  $(-\infty, \frac{9}{2}) \cup [9, \infty)$

17. Solve:  $|2+3x|=5$ .

$$x \geq 9$$

$$-2x > -9$$

17.  $x=1$     $x=\frac{-7}{3}$

$$2+3x = -5$$

$$2+3x = 5$$

$$x < \frac{9}{2}$$

$$3x = -7 \Rightarrow x = \frac{-7}{3}$$

$$3x = 3 \Rightarrow x = 1$$

18. Solve:  $|2-5x| \leq 3$ . Write your answer in interval notation.

$$-3 \leq 2-5x \leq 3$$

$$-5 \leq -5x \leq 1$$

$$1 \geq x \geq -\frac{1}{5}$$

18.  $(-\frac{1}{5}, 1]$

19. Solve:  $|1-2x| > 2$ . Write your answer in interval notation.

$$1-2x < -2$$

$$1-2x > +2$$

$$-2x < -3$$

$$-2x > 1$$

$$x > \frac{3}{2}$$

$$x < -\frac{1}{2}$$

19.  $(-\infty, -\frac{1}{2}) \cup (\frac{3}{2}, \infty)$

20. Solve the formula  $A = 2\pi rh$  for  $r$ .

20.  $r = \frac{A}{2\pi h}$

$A = 2\pi rh$    Divide both sides of equation by  $2\pi h$

$$\frac{A}{2\pi h} = \frac{2\pi rh}{2\pi h}$$

$$\frac{A}{2\pi h} = r$$