

1. (1.4 p123 #25; 5 points) Circle the correct answer (2 pts) and show your work (3 pts).

Find the real solutions:  $3 + \sqrt{3x+1} = x$

(a)  $x = 1$  or  $x = -8$  (b)  $x = 1$  or  $x = 8$  (c)  $x = 8$  (d)  $x = -8$

$$\sqrt{3x+1} = x-3 \quad 3x+1 = (x-3)^2 = x^2 - 6x + 9 \quad 0 = x^2 - 9x + 8 \quad 0 = (x-8)(x-1)$$

$$x = 8 \text{ or } x = 1$$

Check: for  $x = 8$ , we have  $3 + \sqrt{3 \cdot 8 + 1} = 3 + \sqrt{25} = 3 + 5 = 8$  for  $x = 1$ , we have  $3 + \sqrt{3 \cdot 1 + 1} = 3 + \sqrt{4} = 3 + 2 \neq 1$

The answer is (c)  $x = 8$

2. (1.5 p130 Example 9; 5 points) Circle the correct answer (2 pts) and show your work (3 pts).

Solve the inequality  $-5 < 3x - 2 < 1$ . The solution set is

(a)  $[-1, 1]$  (b)  $(-1, 1)$  (c)  $[-\frac{7}{3}, -\frac{1}{3}]$  (d)  $(-\frac{7}{3}, -\frac{1}{3})$  (e) None of these

$$-5 < 3x - 2 < 1 \quad -3 < 3x < 3 \quad -1 < x < 1$$

The answer is (b)  $(-1, 1)$ .

Remember the notation:  $(a, b) = \{x \mid a < x < b\}$  and  $[a, b] = \{x \mid a \leq x \leq b\}$  (review Table 1 on page 126).

3. (1.5 p134 #78; 5 points) Circle the correct answer (2 pts) and show your work (3 pts).

Solve the inequality  $(x-1)(x+1) > (x-3)(x+4)$ . The solution set is

(a)  $\{x \mid x < -13\}$  (b)  $\{x \mid x < -11\}$  (c)  $\{x \mid x < 11\}$  (d) None of these

$$(x-1)(x+1) > (x-3)(x+4) \quad x^2 - 1 > x^2 + x - 12 \quad -1 > x - 12 \quad 11 > x$$

The answer is (c)  $\{x \mid x < 11\}$

4. (1.6 p140 #48; 5 points) Circle the correct answer (2 pts) and show your work (3 pts).

Solve the inequality  $|-x-2| \geq 1$ . The solution set is (a) None of these

(b)  $\{x \mid x < -3 \text{ or } x > -1\}$  (c)  $\{x \mid x \leq -3 \text{ or } x \geq -1\}$  (d)  $\{x \mid x \geq -3 \text{ or } x \leq -1\}$

$$-x - 2 \geq 1 \text{ or } -x - 2 \leq -1$$

$$x + 2 \leq -1 \text{ or } x + 2 \geq 1$$

$$x \leq -3 \text{ or } x \geq -1$$

The answer is (c)