M$5 Homework 3

In 1 – 6, solve each inequality and graph its solution set on a number line.

1. $4 \le 2x < 8$

2. $(2m \ge -2) \wedge (-3m > -1)$

3. $5 \le \frac{x}{3} + 5 < 6$

4. $(3(x-2) < 9) \vee (3(x-2) > 15)$

5. $2x - 3 < 5 \le 2 - 3x$

6. $(2x - 2 < -2) \vee (3(x+5) > 2x + 15)$

7. True or False: Every rational number is a real number.

8. True or False: Every repeating decimal represents a rational number.

9. Name the property of real numbers that is used to justify each equation:

   a. $3(4-x) = 12 - 3x$
   b. $12 - 3x = -3x + 12$
   c. $-3x + 12 - 12 = -3x + 0$
   d. $-3x + 0 = -3x$
   e. $-\frac{1}{3}(-3x) = 1x$
   f. $1x = x$

10. Determine under which of the four basic arithmetic operations (addition, subtraction, multiplication, and division) the following set is closed.

    $$\{\text{all real numbers except } 0\}$$

    Give counterexamples for any operation under which the given set is not closed.