1.3 Extension: The distributive property of multiplication over addition

1. Simplify each expression. (use fractions, not decimals)

   (a) $\frac{1}{7} + \frac{3}{7}$

   (c) $\frac{5}{3} - \frac{1}{6}$

   (b) $4(\frac{1}{4}x + 2)$

   (d) $\frac{2}{3}(6x + 15)$

   Solve each equation twice, for (a) first distribute, and for (b) multiply both sides of the equation by the fraction's denominator first.

   Distribute first   Multiply by the denominator first

2. (a) $\frac{1}{5}(x + 8) = 2$

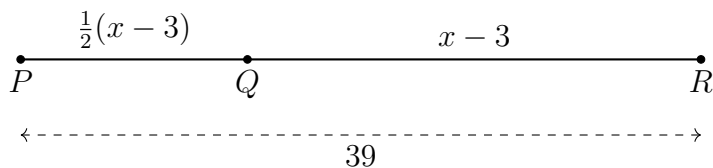   (b) $\frac{1}{5}(x + 8) = 2$

3. (a) $\frac{1}{6}(6x + 18) = 11$

   (b) $\frac{1}{6}(6x + 18) = 11$

4. Write down a rule for under what conditions is it more efficient to first distribute versus multiply by the denominator when solving an algebra equation.

A check is required for all algebra solutions

5. Given the segment $\overline{PQR}$ with $PQ = \frac{1}{2}(x-3)$, $QR = x-3$, $QR = 39$. Find x.

6. Given $x = -2$ simplify each expression. (Do these problems in your head.)

   (a) $|x + 3| =$

   (b) $|10 - x| =$

   (c) $2 \times |x| =$

   (d) $|-8| + x =$

7. Find all values of x that satisfy each equation. (show the check)

   (a) $|x + 2| = 5$

   (b) $|x - 4| = 12$