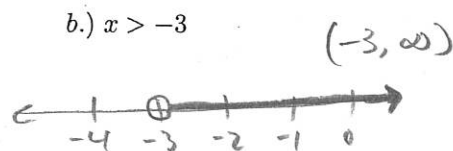
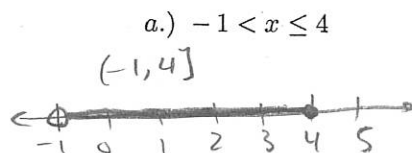


§P.1 & P.2: Real Numbers and Equations

- 1.] Use the number line and interval notation to describe the subset of real numbers that the following inequalities represent:



- 2.] Simplify the following expressions:

a.) $|3 - 8| = |-5| = \boxed{5}$

b.) $-3 \cdot |-3| = (-3)(-3) = (-3)(3) = \boxed{-9}$

c.) $\frac{2}{3} - \frac{5}{4} = \frac{2}{3}(\frac{4}{4}) - \frac{5}{4}(\frac{3}{3}) = \frac{8}{12} - \frac{15}{12} = \boxed{-\frac{7}{12}}$

d.) $\frac{3x}{10} \cdot \frac{5}{6} + 3x = \frac{15x}{60} + 3x = \frac{1}{4}x + 3x = \frac{1}{4}x + \frac{12}{4}x = \boxed{\frac{13}{4}x}$

e.) $\frac{\frac{6x+6}{2}}{\frac{3}{5x}} = \frac{6x+6}{2} \cdot \frac{5x}{3} = \frac{6(x+1)}{2} \cdot \frac{5x}{3} = \frac{6(x+1)(5x)}{6} = (x+1)5x = \boxed{5x^2 + 5x}$

- 3.] Solve the linear equation: $\frac{5x}{4} + \frac{1}{2} = x - \frac{1}{2}$

$$\frac{5x}{4} - x = -\frac{1}{2} - \frac{1}{2}$$

$$\Rightarrow \frac{5x}{4} - \frac{4x}{4} = -1$$

$$\Rightarrow \frac{x}{4} = -1$$

$$\Rightarrow \boxed{x = -4}$$

4.] Solve the quadratic equation: $16x^2 - 9 = 0$

$$\begin{aligned}
 16x^2 &= 9 \\
 \Rightarrow x^2 &= \frac{9}{16} \\
 \Rightarrow x &= \pm \sqrt{\frac{9}{16}} \\
 &\rightarrow x = \pm \frac{\sqrt{9}}{\sqrt{16}} \\
 &\rightarrow x = \pm \frac{3}{4} \rightarrow \boxed{x = -\frac{3}{4}, x = \frac{3}{4}}
 \end{aligned}$$

5.] Solve the quadratic equation: $x^2 - 2x - 8 = 0$

$$\begin{aligned}
 x^2 - 2x - 8 &= 0 \\
 \Rightarrow (x-4)(x+2) &= 0 \\
 \Rightarrow x-4=0 \quad x+2=0 &\rightarrow \boxed{x=4, x=-2}
 \end{aligned}$$

6.] Solve the quadratic equation: $x^2 + 8x + 14 = 0$

$$\begin{aligned}
 x^2 + 8x &= -14 \\
 \Rightarrow x^2 + 8x + (4)^2 &= -14 + (4)^2 \\
 \Rightarrow x^2 + 8x + 16 &= -14 + 16 \\
 &\rightarrow (x+4)^2 = 2 \\
 &\Rightarrow x+4 = \pm \sqrt{2} \\
 &\Rightarrow x = -4 \pm \sqrt{2} \\
 &\Rightarrow \boxed{x = -4 - \sqrt{2}, x = -4 + \sqrt{2}}
 \end{aligned}$$

7.] Solve the quadratic equation: $2x^2 - x - 1 = 0$

$$\begin{aligned}
 2x^2 - x - 1 &= 0 \\
 x &= \frac{-(-1) \pm \sqrt{(-1)^2 - 4(2)(-1)}}{2(2)} \\
 x &= \frac{1}{4} \pm \frac{\sqrt{1+8}}{4} \\
 &\rightarrow x = \frac{1}{4} \pm \frac{\sqrt{9}}{4} \\
 &\rightarrow x = \frac{1}{4} \pm \frac{3}{4} \\
 &\rightarrow \boxed{x = 1, x = -\frac{1}{2}}
 \end{aligned}$$

8.] Solve the quadratic equation: $|3x+4| = -x+8$

$$\begin{aligned}
 3x+4 &= -x+8 \\
 \Rightarrow 4x &= 4 \\
 \boxed{x} &= 1
 \end{aligned}$$

$$\begin{aligned}
 3x+4 &= -(-x+8) \\
 3x+4 &= x-8 \\
 2x &= -12 \\
 \boxed{x} &= -6
 \end{aligned}$$