

1. Simplify each of the following expressions. If the answer is a fraction, reduce it to lowest terms.

$$(a) \frac{\frac{2}{5} - \frac{1}{9}}{\frac{2}{3} - \frac{1}{6}} = \frac{\frac{2}{18} - \frac{2}{18}}{\frac{10}{18} - \frac{3}{18}} = \frac{\frac{2}{18}}{\frac{7}{18}} = \frac{2}{3} \cdot \frac{18}{7} = \frac{2 \cdot 3 \cdot 6}{3 \cdot 7} = \frac{12}{7}$$

$$(b) |-2 - 8| - |5 - 12| = |-10| - |-7| = 10 - 7 = 3$$

2. Consider the following sets:

$$A = \{x \mid -2 \leq x \leq 15\}$$

$$B = \{x \mid x > 0\}$$

- (a) Sketch the graph of the intersection of  $A$  and  $B$ .

- (b) Write in interval notation  $A \cup B$ .

$$[-2, \infty)$$

3. (a) Write .000457 in scientific notation.  $4.57 \times 10^{-4}$

- (b) Write  $7.24 \times 10^{-3}$  in decimal notation. .00724

4. Simplify the following:

$$(a) -5^2 = -(5^2) = -25$$

$$(b) (rs^2)^3(4r^2s^5) = (r^3s^6)(4r^2s^5) = 4r^3r^2s^6s^5 = 4r^5s^{11}$$

$$(c) (64)^{2/3} = \sqrt[3]{64^2} = \sqrt[3]{8^2 \cdot 8^2} = \sqrt[3]{(8 \cdot 8 \cdot 8) \cdot 8} = 8\sqrt[3]{8} = 8\sqrt[3]{2 \cdot 2 \cdot 2} = 8 \cdot 2 = 16$$

$$(d) 8^{1/2}(24^{1/2}) = \sqrt{8 \cdot 3 \cdot 8} = \sqrt{(8 \cdot 8) \cdot 3} = 8\sqrt{3}$$

$$(e) \frac{\sqrt{35}}{\sqrt{5}} = \sqrt{\frac{35}{5}} = \sqrt{7}$$

5. (a) Simplify the expression  $\sqrt[5]{a^4b} \sqrt[5]{ab^2}$   
 $\sqrt[5]{a^4b} \sqrt[5]{ab^2} = \sqrt[5]{a^4abb^2} = \sqrt[5]{a^5b^3} = a\sqrt[5]{b^3}$

- (b) Rationalize the denominator  $\frac{1}{\sqrt[5]{x^2}}$

$$\frac{1}{\sqrt[5]{x^2}} = \frac{1}{\sqrt[5]{x^2}} \cdot \frac{\sqrt[5]{x^3}}{\sqrt[5]{x^3}} = \frac{\sqrt[5]{x^3}}{\sqrt[5]{x^2x^3}} = \frac{\sqrt[5]{x^3}}{\sqrt[5]{x^5}} = \frac{\sqrt[5]{x^3}}{x}$$