

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

$$(a) \frac{\frac{3}{11} - \frac{3}{15}}{\frac{3}{10} - \frac{3}{30}} = \frac{\frac{3}{22} - \frac{3}{30}}{\frac{3}{30} - \frac{3}{30}} = \frac{\frac{3}{13}}{\frac{3}{30}} = \frac{18}{13}$$

$$(b) |-3 - 6| - |7 - 9| = |-9| - |-2| = 9 - 2 = 7$$

2. Consider the following sets:

$$A = \{x | -3 \leq x \leq 7\}$$

$$B = \{x | x > 1\}$$

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

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

$$[-3, \infty)$$

3. (a) Write .0000342 in scientific notation. 3.42×10^{-5}

- (b) Write 6.39×10^{-3} in decimal notation. 0.00639

4. Simplify the following:

$$(a) -6^2 = -(6^2) = -36$$

$$(b) (rs^2)^4(4r^3s^4) = (r^4s^8)(4r^3s^4) = 4r^4r^3s^8s^4 = 4r^7s^{12}$$

$$(c) (81)^{3/4} = \sqrt[4]{81^3} = \sqrt[4]{(9 \cdot 9)^3} \\ = \sqrt[4]{9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9} \\ = 9\sqrt[4]{9 \cdot 9} \\ = 9\sqrt[4]{3 \cdot 3 \cdot 3 \cdot 3} \\ = 9 \cdot 3 = 27$$

$$(d) 27^{1/2}(135^{1/2}) = \sqrt{27 \cdot 5 \cdot 27} = 27\sqrt{5}$$

$$(e) \frac{\sqrt{36}}{\sqrt{3}} = \sqrt{\frac{36}{3}} = \sqrt{12} = \sqrt{4 \cdot 3} = 2\sqrt{3}$$

5. (a) Simplify the expression $\sqrt[7]{a^2b^4}\sqrt[7]{a^4b^3}$
 $\sqrt[7]{a^2b^4}\sqrt[7]{a^4b^3} = \sqrt[7]{a^2a^4b^4b^3} = \sqrt[7]{a^6b^7} = b\sqrt[7]{a^6}$

- (b) Rationalize the denominator $\frac{2}{\sqrt[7]{x^5}}$

$$\frac{2}{\sqrt[7]{x^5}} = \frac{2}{\sqrt[7]{x^5}} \cdot \frac{\sqrt[7]{x^2}}{\sqrt[7]{x^2}} = \frac{2\sqrt[7]{x^2}}{\sqrt[7]{x^5x^2}} = \frac{2\sqrt[7]{x^2}}{\sqrt[7]{x^7}} = \frac{2\sqrt[7]{x^2}}{x}$$