

King Fahd University of Petroleum and Minerals
Per-Year Math Program
Math 001- Term 061
Recitation Hour (P2)

Question1

Simplify the expression $\left[\frac{-2^0(x^2y^{-1})^{-3}}{27^{-1}x^{-3}y^6} \right]^{-1/3}$, where x and y are nonzero real numbers.

$$\left[\frac{-2^0(x^2y^{-1})^{-3}}{27^{-1}x^{-3}y^6} \right]^{-1/3} = \left[\frac{-x^{-6}y^3}{27^{-1}x^{-3}y^6} \right]^{-1/3} = \left[\frac{-27y^3x^3}{x^6y^6} \right]^{-1/3} = \left[\frac{-27}{x^3y^3} \right]^{-1/3} = \left[\frac{-x^3y^3}{27} \right]^{1/3} = \frac{-3}{xy}$$

Question2

Evaluate each expression

1. $-2^{-3} = \frac{1}{8}$

2. $\left(\frac{8}{27}\right)^{-2/3} = \left(\frac{27}{8}\right)^{2/3} = \left(\sqrt[3]{\frac{27}{8}}\right)^2 = \frac{9}{4}$

Question3

Simplify $5x^3\sqrt{54x^4} - 3\sqrt[3]{16x^7}$. Write the answer in the simplest form.

$$= 5x\sqrt{3^3 \cdot 2 \cdot x^3 \cdot x} - 3\sqrt[3]{2^3 \cdot 2 \cdot x^3 \cdot x^3 \cdot x} = 5x(3x)\sqrt{2x} - 3(2 \cdot x \cdot x)\sqrt{2x} = 15x^2\sqrt{2x} - 6x^2\sqrt{2x} = 9x^2\sqrt{2x}$$

Question4

Simplify each expression by rationalizing the denominator. Write the result in the simplest form.

1. $\frac{\sqrt{6} - \sqrt{2}}{\sqrt{8} + \sqrt{10}}$

$$\frac{\sqrt{6} - \sqrt{2}}{\sqrt{8} + \sqrt{10}} \cdot \frac{\sqrt{8} - \sqrt{10}}{\sqrt{8} - \sqrt{10}} = \frac{\sqrt{48} - \sqrt{60} - \sqrt{16} + \sqrt{20}}{8 - 10} = \frac{4\sqrt{3} - 2\sqrt{15} - 4 + 2\sqrt{5}}{-2} = -2\sqrt{3} + \sqrt{15} + 2 - \sqrt{5}$$

$$2. \quad \frac{1}{\sqrt[5]{4x^3}} \cdot \frac{\sqrt[5]{8x^2}}{\sqrt[5]{8x^2}} = \frac{\sqrt[5]{8x^2}}{2x}$$

Question5

Write the number $\frac{(4.0 \times 10^{-9})(8.4 \times 10^5)}{(3.0 \times 10^{-6})(1.4 \times 10^{12})}$ in scientific notation.

$$\frac{(4.0 \times 10^{-9})(8.4 \times 10^5)}{(3.0 \times 10^{-6})(1.4 \times 10^{12})} = 8.0 \times 10^{-10}$$