

MATH 101  
Review on Radicals and Rational Exponents

I. Evaluate.

(1)  $(-27)^{-\frac{2}{3}}$

(2)  $8^{\frac{1}{3}} \cdot 8^{-\frac{2}{3}}$

II. Use the rules of exponents to simplify. Write answers with positive exponents only.

(3)  $(9x^6y^2)^{\frac{1}{2}}$

(4)  $\left(\frac{a^{-\frac{1}{2}}}{b^{-\frac{1}{4}}}\right)^{-4}$

(5)  $(a^{\frac{1}{2}}b)^{\frac{1}{2}}(ab^{\frac{1}{2}})$

III. Simplify each radical expression.

(6)  $\sqrt[4]{-81}$

(7)  $\sqrt[3]{-48x}$

(8)  $\frac{\sqrt{3}}{\sqrt{7}}$

(9)  $\frac{1}{\sqrt[3]{3}}$

(10)  $(2\sqrt{5} + \sqrt{2})(3\sqrt{5} - \sqrt{2})$

(11)  $\sqrt{50a} + \sqrt{18a} - \sqrt{2a}$

(12)  $\sqrt{63a^{15}b^7}$

(13)  $\sqrt[3]{2}(\sqrt[3]{12x} - \sqrt[3]{2x})$

(14)  $(3\sqrt{a} + 2)^2$

(15)  $\frac{2 - \sqrt{3}}{\sqrt{2} + \sqrt{6}}$

(16)  $\frac{8 - \sqrt{32}}{20}$

(17)  $(2\sqrt{2}) \div (4\sqrt{10})$

IV. Write as a single radical expression.

(18)  $\sqrt{3} \cdot \sqrt[4]{3}$