

Eleventh Set of Homework

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Due: Thursday March 3

Please note: You should fully justify your answers.

Rational exponents

1. Simplify each of the following:

(a) $\left(\frac{3}{5}\right)^{-2}$

(b) $81^{-\frac{2}{3}}$

(c) $\left(\frac{1}{16}\right)^{\frac{3}{4}}$

(d) $(-64)^{-\frac{2}{3}}$

(e) $-16^{\frac{3}{4}}$

(f) $25^{\frac{3}{2}}$

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

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

(i) $\left(\frac{36}{49}\right)^{-\frac{1}{2}}$

2. Use the properties of exponents to simplify the following expressions. Assume all variables represent positive real numbers.

(a) $\sqrt[3]{16a^4b^8}$

(b) $\sqrt[4]{81x^{10}y^6z^4}$

(c) $\sqrt{x^4y^7}\sqrt{z}$

(d) $\sqrt[3]{a^5b^8}\sqrt{c}$

3. Simplify each of the following expressions. The results should contain only positive exponents and rationalized denominators. Assume all variables represent positive real numbers.

(a) $x^{\frac{2}{5}}x^{\frac{3}{5}}$

(b) $y^{\frac{2}{3}}y^{\frac{4}{3}}$

(c) $\left(b^{\frac{2}{5}}\right)^{\frac{5}{2}}$

(d) $\left(x^{\frac{3}{5}}y^4z^{\frac{8}{15}}\right)^{\frac{5}{2}}$

(e) $\frac{x^{\frac{3}{4}}y^{-2}}{z^{-\frac{3}{8}}y^{\frac{1}{4}}}$

(f) $\left(\frac{a^2b^3c^{-6}}{4a^{-3}b^4}\right)^{\frac{1}{2}}$

(g) $\left(\frac{x^{-\frac{1}{2}}y^{\frac{3}{4}}}{z^{\frac{5}{8}}}\right)^{-8}$