

Math 0408 – Intermediate Algebra  
Rational Exponents

Evaluate each of the following

1.  $27^{1/3}$

2.  $-49^{1/2}$

3.  $(-49)^{1/2}$

4.  $\left(\frac{16}{25}\right)^{-1/2}$

5.  $16^{3/4}$

6.  $8^{-2/3}$

Simplify each of the following

7.  $\left(\frac{a^{-1/2}}{b^{1/3}}\right)^6$

8.  $\frac{\left(x^{1/3}y^{-3}\right)^6}{x^4y^{10}}$

9.  $\frac{(25a^6b^4)^{1/2}}{(8a^{-9}b^3)^{-1/3}}$

10.  $\left(x^{3/5} + 2\right)\left(x^{3/5} - 7\right)$

**Solutions:**

1.  $27^{\frac{1}{3}}$

3

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

Not a real number

5.  $16^{\frac{3}{4}}$

8

Simplify each of the following

7.  $\left(\frac{a^{-\frac{1}{2}}}{b^{\frac{1}{3}}}\right)^6$

$$\frac{1}{a^3 b^2}$$

9.  $\frac{(25a^6 b^4)^{\frac{1}{2}}}{(8a^{-9} b^3)^{-\frac{1}{3}}}$

$$10b^3$$

2.  $-49^{\frac{1}{2}}$

-7

4.  $\left(\frac{16}{25}\right)^{-\frac{1}{2}}$

$$\frac{5}{4}$$

6.  $8^{-\frac{2}{3}}$

$$\frac{1}{4}$$

8.  $\frac{\left(x^{\frac{1}{3}} y^{-3}\right)^6}{x^4 y^{10}}$

$$\frac{1}{x^2 y^{28}}$$

10.  $\left(x^{\frac{3}{5}} + 2\right)\left(x^{\frac{3}{5}} - 7\right)$

$$x^{\frac{6}{5}} - 5x^{\frac{3}{5}} - 14$$