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Foundation and Pre-Calculus 10
4.5 and 4.6 Review

Name: key

Do not leave any negative exponents or decimals in your final answers.

1. Evaluate.

a) 5^{-2}

$= \frac{1}{5^2}$

$= \frac{1}{25}$

a) $\frac{1}{25}$

b) $(-3)^{-3}$

$\frac{1}{(-3)^3} = \frac{1}{(-3)(-3)(-3)}$

$= \frac{1}{-27}$

b) $-\frac{1}{27}$

c) $\left(\frac{2}{3}\right)^{-2} = \left(\frac{3}{2}\right)^2$

$= \frac{3^2}{2^2}$

$= \frac{9}{4}$

c) $\frac{9}{4}$

d) $\left(\frac{1}{3}\right)^{-4} = \left(\frac{3}{1}\right)^4 = 3^4$

$= 81$

d) 81

e) 0.3^{-2}

$= \left(\frac{3}{10}\right)^{-2} = \left(\frac{10}{3}\right)^2$

$= \frac{10^2}{3^2}$

e) $\frac{100}{9}$

f) $\frac{1}{5^{-2}} = \frac{5^2}{1} = 25$

f) 25

2. Simplify by writing as a single power.

a) $0.2^4 \cdot 0.2^{-7}$

0.2^{-3}

$\left(\frac{2}{10}\right)^{-3}$

$\left(\frac{10}{2}\right)^3$

5^3

a) 5^3

b) $\left[\left(-\frac{3}{4}\right)^2\right]^{-3} \div \left[\left(-\frac{3}{4}\right)^4\right]^{-5}$

$\left(-\frac{3}{4}\right)^{-6} \div \left(-\frac{3}{4}\right)^{-20}$

$= \left(-\frac{3}{4}\right)^{14}$

b)

c) $\frac{7^{\frac{5}{3}} \cdot 7^{-\frac{1}{3}}}{7^{\frac{1}{3}}}$

$= \frac{7^{\frac{5}{3} + \frac{-1}{3}}}{7^{\frac{1}{3}}}$

$= \frac{7^{\frac{4}{3}}}{7^{\frac{1}{3}}} = 7^{\frac{4}{3} - \frac{1}{3}} = 7^{\frac{3}{3}}$

$= 7^1$

$= 7$

c)

3. Simplify each expression, then evaluate:

a) $\left(\frac{5}{3}\right)^{\frac{3}{2}}\left(\frac{5}{3}\right)^{\frac{1}{2}}$

$= \left(\frac{5}{3}\right)^{4/2}$

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

a) $\frac{25}{9}$

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

$= (-4)^{\frac{2}{3}--\frac{4}{3}}$

$= (-4)^{\frac{2}{3}+\frac{4}{3}}$

$= (-4)^{\frac{6}{3}} = (-4)^{2}$

b) 16

c) $\left[\left(\frac{-6}{5}\right)^{\frac{1}{3}}\right]^{6}$

$= \left(\frac{-6}{5}\right)^{6/3}$

$= \left(\frac{-6}{5}\right)^{2}$

c) $\frac{36}{25}$

d) $\frac{0.4^{\frac{3}{4}}}{0.4^{\frac{7}{4}}}$

$= 0.4^{3/4-7/4}$

$= 0.4^{-4/4}$

$= 0.4^{-1}$

$= \left(\frac{4}{10}\right)^{-1}$

$= \frac{10}{4}$

d) $= 5/2$

4. Simplify.

a) $m^5n^{-3} \cdot m^2n^2$

$= m^7 n^{-1}$

a) $\frac{m^7}{n}$

b) $\frac{8x^3y^{-5}}{12xy^2}$

$= \frac{2}{3} x^{3-1-5-2} \cdot y$

$= \frac{2}{3} x^2 y^{-7}$

b) $\frac{2x^2}{3y^7}$

c) $\left(a^4b^2\right)^{3/2}$

$= a^{\frac{4\cdot3}{2}} b^{\frac{2\cdot3}{2}}$

$= a^{\frac{12}{2}} b^{\frac{6}{2}}$

c) $a^6 b^3$

d) $\left(x^3y^{-3/2}\right)\left(x^{-4}y^{7/2}\right)$

$= x^{-1} y^{\frac{4}{2}}$

$= \frac{y^2}{x}$

d)

e) $\frac{15x^{-5/2}y^{7/2}}{3x^{1/2}y^{-1/2}}$

$= 5x^{-5/2-1/2} y^{7/2--1/2}$

$= 5x^{-6/2} y^{8/2}$

$= 5x^{-3} y^{4}$

e) $= \frac{5y^4}{x^3}$

f) $\left(\frac{x^2y^4}{x^4y^8}\right)^{1/2}$

$\left(x^{-2}y^{-4}\right)^{1/2}$

$x^{-2/2} y^{-4/2}$

$x^{-1} y^{-2}$

f) $= \frac{1}{xy^2}$