

Math 9B Quiz: Indices

Name: \_\_\_\_\_

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1) Use laws of exponents and simplify. Write your answers in positive exponents.

a)  $\left(\frac{15x^6}{5x^2y^4}\right)^2$

$$\left(\frac{15}{5} \cdot \frac{x^6}{x^2} \cdot \frac{1}{y^4}\right)^2$$

$$\left(\frac{3 \cdot x^4}{y^4}\right)^2 = \frac{3^2 \cdot x^8}{y^8}$$

b)  $\left(\frac{2xyz^2}{4xy^2z}\right)^{-2}$

$$\left(\frac{4 \cancel{x} y^2 z^2}{2 \cancel{x} y^2 z^2}\right)^2$$

$$\frac{2^2 y^2}{z^2} \cdot \frac{z^2}{z^2} = \frac{4 y^2}{z^2}$$

$$\frac{4 y^2}{z^2}$$

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

$$\frac{(15x^4y^5z^2)^2}{(3x^2y^3z^4)^2} \cdot (3x^2y^3z^4)^2$$

$$15^2 x^8 y^{10} z^4$$

$$\frac{x}{(y+z)^2} (y+z)^3$$

$$x \cdot (y+z)$$

$$d) \left( \frac{10x^3y^4z^4}{2x^2y^3z^4} \right)^{-1}$$

$$\frac{2x^2y^3z^4}{10x^3y^4z^4}$$

$$\frac{1}{5xy}$$

2) Find the value of x for the following... [Formative; try your best ☺]...

$$\begin{aligned}
 \text{a) } 8^{x-3} &= \frac{1}{32} \\
 2^{3(x-3)} &= 2^{-5} \\
 2 &= 2^{-5} \\
 2^{3(x-3)} &= 2^{-5} \\
 3(x-3) &= -5 \\
 \frac{3(x-3)}{3} &= \frac{-5}{3} \\
 x-3 &= \frac{-5}{3} \\
 +3 & \quad +3 \\
 x &= \frac{-5}{3} + 3 \\
 &= \frac{4}{3}
 \end{aligned}$$

$$\begin{aligned}
 \text{b) } 9^{x-2} &= 27^{2-2x} \\
 3^{2(x-2)} &= 3^{3(2-2x)} \\
 2(x-2) &= 3(2-2x) \\
 2x-4 &= 6-6x \\
 +6x & \quad +6x \\
 8x-4 &= 6 \\
 +4 & \quad +4 \\
 8x &= 10 \\
 x &= \frac{10}{8} = \frac{5}{4}
 \end{aligned}$$