

Algebra II

5-2

Laws of Exponents

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$$1) \frac{x^9}{x^5} = \underline{x^4}$$

$$2) x^1 = \underline{x}$$

$$3) (x^3)^5 = \underline{x^{15}}$$

$$4) \frac{x^2}{x^7} = \underline{\frac{1}{x^5} = x^{-5}}$$

$$5) x^5 \cdot x^2 = \underline{x^7}$$

$$6) x^0 = \underline{1} \quad 0^0 \text{ is undefined}$$

$$7) x^{-1} = \underline{\frac{1}{x}} \quad \text{note: not a negative number!}$$

$$8) -3^{-2} = \underline{-\frac{1}{3^2} = -\frac{1}{9}}$$

$$\begin{aligned} *) \quad x^2(1) &= x^2 \\ x^2(x^0) &= x^2 \\ 2 + (0) &= 2 \end{aligned}$$

1) When multiplying, add the powers.

2) When dividing, subtract the powers.

3) When the power is outside the parentheses, multiply the powers.

4) A negative power means reciprocal.
(one over)

Simplify. (pg 218)

$$1) 3 \cdot 5^{-1} = 3\left(\frac{1}{5}\right)$$
$$\frac{3}{5}$$

$$17) \left(-\frac{5}{3}\right)^{-3} = \left(-\frac{3}{5}\right)^3$$

reciprocal ↵

$$= -\frac{27}{125}$$

$$21) \frac{3x^{-2}}{y^{-1}} = \frac{3 \frac{1}{x^2}}{\frac{1}{y}} = \frac{3}{1} \cdot \frac{1}{x^2} \div \frac{1}{y}$$
$$= \frac{3}{1} \cdot \frac{1}{x^2} \cdot \frac{y}{1} = \frac{3y}{x^2}$$

$$\begin{aligned}
 37) & \left(\frac{x^2}{y^{-1}}\right)^{-2} \left(\frac{y^2}{x^{-1}}\right)^2 \\
 & \frac{x^{-4}}{y^2} \cdot \frac{y^4}{x^{-2}} \\
 & \frac{y^4 x^2}{x^4 y^2} \\
 & \frac{y^2}{x^2}
 \end{aligned}$$

Pg 219

1-8 all
 12-42 even
 48-52 even