

1.3

Laws of Exponents

Multiplying
to multiply
ADD
exponents

$$2^4 \cdot 2^3 = 2^{4+3} = 2^7$$

$$-3x^2 \cdot 4x^5$$

$$-12x^{2+5} = -12x^7$$

$$-7x^2 \cdot 11x^4 = -77x^6$$

$$3x^2y \cdot 4x^3y^2 = 12x^5y^3$$

$$4x^2y \cdot 2x^4 = 8x^6y$$

Dividing Exponents

Law of exponents - to divide powers
w/ the same base,
SUBTRACT exponents

$$\frac{3^7}{3^4} = \frac{\cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot 3 \cdot 3 \cdot 3}{\cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3}}$$

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

$$= 3^3$$

$$\frac{4^8}{4^2} = 4^{8-2} = 4^6$$

$$\frac{5^7}{5} = 5^{7-1} = 5^6$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$\frac{a^{14}}{a^8} = a^6$$

$$\frac{2^5}{2^2} \cdot \frac{3^5}{3^4} \cdot \frac{5^2}{5}$$

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Group by common bases

$$\frac{2^5}{2^2} = 2^3$$

$$\frac{3^5}{3^4} = 3^1$$

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

$$2^3 \cdot 3^1 \cdot 5^1$$

$$2 \cdot 2 \cdot 2$$

$$8 \cdot 3 \cdot 5 = 120$$

$$\frac{2^4 \cdot 5^3 \cdot 9^2}{2^3 \cdot 5 \cdot 9} = 2^1 \cdot 5^2 \cdot 9^1$$

$$\frac{2^4 \cdot 3^2 \cdot 8^3}{3 \cdot 8^2}$$

$$2^4 \cdot 3 \cdot 8$$

$$\frac{12a^{14}}{2a^8} = 6a^6$$

$$\frac{5^6 \cdot 7^4 \cdot 8^3}{5^4 \cdot 7^2 \cdot 8^2}$$

$$5^2 \cdot 7^2 \cdot 8^1$$