M9 - 3.5 - Combo Exponents Laws Notes

Simplify

$$\frac{2^3 \times 2^4}{2^5} =$$

$$\frac{2^{3+4}}{2^5}$$ Add Exponents

$$\frac{2^7}{2^5}$$ Subtract Exponents

$$2^{7-5}$$

$$2^2$$ Simplify

$$\boxed{4}$$

Check on Calculator!

$$\frac{(2^3 \times 2^4)}{(2^5)} = 4 \checkmark$$

$$\frac{3^4 \times 3^{-3}}{9} =$$

$$\frac{3^1}{3^2}$$ Add Exponents
Change Base

$$3^{1-2}$$ Subtract Exponents
Negative Exponents

$$3^{-1}$$

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

$$\boxed{\frac{1}{3}}$$ Simplify

$$\frac{4^2 \times 16^3}{128^2} =$$

$$\frac{((2^2)^2 \times (2^4)^3)}{(2^7)^2}$$ Change of base

$$\frac{2^4 \times 2^{12}}{2^{14}}$$ Multiply Exponents

$$\frac{2^{16}}{2^{14}}$$ Add Exponents

$$2^{(16-14)}$$ Subtract Exponents

$$2^2$$

$$\boxed{4}$$ Simplify

Simplify

$$\frac{(2x^3y^2)(6xy^4)}{(4x^3y)} =$$

$$\frac{12x^4y^6}{4x^3y}$$ Multiply Coefficients
Add Exponents
Divide
Subtract Exponents

$$\boxed{3xy^5}$$

$$\frac{(8x^3y^2)^2(6xy^4)^{-2}}{(4x^3y)} =$$

$$\frac{(8x^3y^2)^2}{(4x^3y)(6xy^4)^2}$$ Negative Exponents

$$\frac{64x^6y^4}{(4x^3y)(36x^2y^8)}$$ Multiply Exponents
Multiply Coefficients

$$\frac{64x^6y^4}{144x^5y^9}$$ Add Exponents
Subtract Exponents

$$\boxed{\frac{4x}{9y^5}}$$ Simplify

$$\frac{y^4}{y^9} = y^{4-9} = y^{-5} = \frac{1}{y^5}$$ Subtract from Bottom

$$\frac{y^4}{y^9} = \frac{1}{y^{9-4}} = \frac{1}{y^5}$$ Subtract from Top