Unit 3 – Lesson 1

Laws of Exponents

Product of Powers

$(x^2)(x^2) = x^{2+2} = x^4$

Quotient of Powers

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

Power raised to a power

$(x^2)^3 = x^6$ OR $(xy)^3 = x^3y^3$

Negative Exponents

$x^{-2} = \frac{1}{x^2}$ OR $\frac{1}{x^{-2}} = x^2$

Zero Rule

$x^0 = 1$

Ex 1) $(2x^2y^3z)(3xy^2z)$ This is the Product of Powers Rule (multiply the constants, add the exponents)

$(6x^3y^5z^2)$

Ex 2) $\frac{3x^2y^5z^4}{6xy^3z^4}$ This is the quotient of powers rule (divide the constants, subtract the exponents)

$\frac{xy^2}{2}$

Ex 3) $(3xy^2z^5)^2$ This is the power raised to a power rule (every term is raised to the outside exponent)

$(3)^2\,(x)^2\,(y^2)^2\,(z^5)^2 = 9x^2y^4z^{10}$

Ex 4) $3x^2y^{-4}z$ This is the negative exponent rule (exponent must be positive)

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

Ex 5) $4x^0y^{-2}z^3$ This has two rules – zero rule and negative exponent rule ($x^0 = 1$)

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