

Exponents Review

Simplify the following expressions :

$$A = 5^7 \times 5^{-8} = 5^{-1} = \frac{1}{5}$$

$$B = \frac{2^{-12}}{2^{-15}} = 2^3 = 8$$

$$C = \frac{5^5 \times 5^{-12}}{5^{-4} \times 5^{-5}} = \frac{5^{-7}}{5^{-9}} = 5^2 = 25$$

$$D = \left[\left(\frac{2}{5} \right)^{-3} \times \left(\frac{2}{5} \right)^4 \right]^{-2} = \left[\left(\frac{2}{5} \right)^1 \right]^{-2} = \left(\frac{2}{5} \right)^{-2} = \left(\frac{5}{2} \right)^2 = \frac{25}{4}$$

$$E = (3x^2y^{-5})^{-4} \times (2x^{-8}y^6)^3 = 3^{-4} x^{-8} y^{20} \times 2^3 x^{-24} y^{18} = \frac{2^3}{3^4} x^{-32} y^{38} = \frac{8y^{38}}{81x^{32}}$$

$$F = \left(\frac{25x^{-5}}{125x^3} \right)^{-3} = \left(\frac{1}{5x^8} \right)^{-3} = (5x^8)^3 = 5^3 x^{24} = 125x^{24}$$

$$G = (3x - 5y)^2 = 9x^2 - 30xy + 25y^2$$

$$H = \frac{2^5 - 2^4}{2^4 - 2^3} = \frac{32 - 16}{16 - 8} = \frac{16}{8} = 2 \quad \text{or} \quad \frac{2^4(2-1)}{2^3(2-1)} = 2$$

$$I = \frac{7^1}{7^3} = \frac{1}{7^2} = \frac{1}{49}$$

$$J = (6x^3y^{-5})^{-3} \times (36x^{-8}y^7)^2 = 6^{-3} x^{-9} y^{15} \times (6^2)^2 x^{-16} y^{14} = 6x^{-25} y^{29} = \frac{6y^{29}}{x^{25}}$$

$$K = \left(\frac{2}{3} x^5 y^{-12} \right)^5 \times \left(\frac{3}{2} x^{-6} y^4 \right)^3 = \left(\frac{2}{3} \right)^5 x^{25} y^{-60} \left(\frac{3}{2} \right)^3 x^{-18} y^{12} = \left(\frac{2}{3} \right)^5 \left(\frac{2}{3} \right)^{-3} x^7 y^{-48} = \frac{4x^7}{9y^{48}}$$

$$L = \left(\frac{8x^3y^{-5}}{25x^{-2}y^{-4}} \right)^{-2} \times (32x^6y^8)^{-3} = \left(\frac{x^5}{2^2 y^1} \right)^{-2} \times (2^5)^{-3} x^{-18} y^{-24} = \frac{1}{2^{17} x^{28} y^{22}}$$

$$M = \left(\frac{2x^5y^3}{3x^{-3}y^8} \right)^{-4} = \left(\frac{2}{3} \right)^{-4} x^{-32} y^{20} = \frac{3^4 y^{20}}{2^4 x^{32}} = \frac{81y^{20}}{16x^{32}}$$

$$N = \frac{3x^0y^5 \times (9x^{-5}y^3)^{-2}}{3^5x^{-8}y^{-2}} = \frac{3^1 y^5 \cdot 3^{-4} x^{10} y^{-6}}{3^5 x^{-8} y^{-2}} = \frac{x^{18} y}{3^8}$$