

Name: _____

Date: _____

Assignment Handout - Answers

1. Simplify the following expressions. Show all your work.

$$\begin{array}{llll} \text{a.} & y^{64} \times y^{42} & \text{b.} & p^{90} \times p^{12} & \text{c.} & (r^7 \times r^3)^4 & \text{d.} & (s^{14} \times s^{-12})^3 \\ & = y^{108} & & = p^{102} & & = r^{40} & & = s^6 \end{array}$$

$$\begin{array}{llll} \text{e.} & \frac{q^{64}}{q^{42}} & \text{f.} & \frac{a^{23}}{a^{17}} & \text{g.} & \left(\frac{k^{46}}{k^{32}}\right)^3 & \text{h.} & \left(\frac{g^{21}}{g^{21}}\right)^8 \\ & = q^{22} & & = a^6 & & = k^{42} & & = 1 \end{array}$$

$$\begin{array}{llll} \text{i.} & \frac{z}{z^8} & \text{j.} & \frac{c^{12}}{c^{27}} & \text{k.} & \left(\frac{d^3}{d^9}\right)^4 & \text{l.} & \left(\frac{f^{32}}{f^{38}}\right)^4 \\ & = \frac{1}{z^7} & & = \frac{1}{c^{15}} & & = \frac{1}{d^{24}} & & = \frac{1}{f^{24}} \end{array}$$

$$\begin{array}{llll} \text{m.} & (x^{13})^4 & \text{n.} & (t^7)^{-3} & \text{o.} & (j^{-3})^7 & \text{p.} & (v^{-4})^{-5} \\ & = x^{52} & & = \frac{1}{t^{21}} & & = \frac{1}{j^{21}} & & = v^{20} \end{array}$$

$$\begin{array}{ll} \text{q.} & \left(\frac{(w^3 \times w^4)^2}{(w^{-2} \times w^5)^{-2}}\right)^3 \\ & = w^{60} \end{array} \quad \begin{array}{ll} \text{r.} & \left(\frac{a^5}{a^9}\right)^4 \times \left(\frac{a^3}{a^6}\right)^2 \\ & = \frac{1}{a^{22}} \end{array}$$

2. Simplify the following expressions. Show all your work.

$$\text{a. } \left(\frac{9}{12a}\right)^3 \quad \text{b. } (2x^4y)^4 \quad \text{c. } (m^2n^{-5})^3 \quad \text{d. } (-2ab^4)(3b^2c^2)$$

$$= \frac{27}{64a^3}$$

$$= 16x^{16}y^4$$

$$= \frac{m^6}{n^{15}}$$

$$= -6ab^6c^2$$

$$\text{e. } \left(\frac{3c^5}{2c^7}\right)^{-3} \quad \text{f. } 2(c^5d^{-4})^{-5} \quad \text{g. } (2xy^4)^{-5} \quad \text{h. } 3(-4a^4b^{-5})^{-3}$$

$$= \frac{8c^6}{27}$$

$$= \frac{2d^{20}}{c^{25}}$$

$$= \frac{1}{32x^5y^{20}}$$

$$= \frac{-3b^{15}}{64a^{12}}$$

$$\text{i. } \left(\frac{x^6y^5}{y^9z^{-2}}\right)^{-3} \quad \text{j. } \left(2 \times \frac{a^4}{a^5} \times \frac{a^{-4}}{a^{-5}}\right)^4$$

$$= \frac{y^{12}z^6}{x^{18}}$$

$$= 16$$