

IN-CLASS ASSIGNMENT #1
 SIMPLIFYING EXPONENTS
 201-943-DW
 AUGUST 27th 2012
 SOLUTIONS

SIMPLIFY THE FOLLOWING EXPRESSIONS

$$\textcircled{1} \quad 2 \cdot 3^{-1} = 2 \cdot \frac{1}{3} = \boxed{\frac{2}{3}}$$

$$\textcircled{2} \quad (-4)(-2)^{-3} = (-4) \left(\frac{1}{(-2)^3} \right) = \frac{-4}{-8} = \boxed{\frac{1}{2}}$$

$$\textcircled{3} \quad \frac{x^{-1}}{\left(\frac{1}{-x}\right)^{-1}} = \frac{x^{-1}}{(-x)} = \frac{1}{(-x)x} = \boxed{-\frac{1}{x^2}}$$

$$\textcircled{4} \quad \frac{x^2 y^{-1}}{\frac{1}{2xy^{-2}}} = \frac{\frac{x^2}{y}}{\frac{y^2}{2x}} = \frac{x^2}{y} \cdot \frac{2x}{y^2} = \boxed{\frac{2x^3}{y^3}}$$

$$\textcircled{5} \quad \frac{(-3xy)^{-11}}{3^{-10} x^{-3} y^2} = \frac{3^{10} x^3}{(-3xy)^{11} y^2} = \frac{3^{10} x^3}{-3^{11} x^{11} y^{11} y^2} = \boxed{\frac{-1}{3x^8 y^{13}}}$$

⑥
$$\frac{\frac{1}{2^{-1}b}}{\frac{(-2)^4}{b^{-3}}} = \frac{1}{2^{-1}b} \cdot \frac{b^{-3}}{(-2)^4} = \frac{2}{b(-2)^4 b^3} = \boxed{\frac{1}{2^3 b^4}}$$

⑦
$$\left(\frac{5xy^{-1}}{xy^{-2}}\right)^{-1} \left(\frac{5^2x^{-2}y^2}{5^{-4}x^4y^3}\right)^2$$

$$= \left(\frac{5^{-1}x^{-1}y}{x^{-1}y^2}\right) \left(\frac{5^4x^{-4}y^4}{5^{-8}x^8y^6}\right)$$

$$= \left(\frac{1}{5y}\right) \left(\frac{5^{12}}{x^{12}y^2}\right) = \boxed{\frac{5^{11}}{x^{12}y^3}}$$

⑧
$$\frac{(2a)^{-3} \left(\frac{1}{b}\right)^{-1} (a^2b)^3}{(-2^2a^2)^{-1} (ab)^2 \left(\frac{2^3}{a^2b^{-1}}\right)} = \frac{b(a^2b)^3(-2^2a^2)}{(ab)^2 \left(\frac{2^3b}{a^2}\right)}$$

$$= \frac{b(a^6b^3)(-2^2a^2)}{a^2b^2 2^3ba^{-2}}$$

$$= \frac{-2^2a^8b^4}{2^3b^3} = \boxed{\frac{-a^8b}{2}}$$

$$\textcircled{9} \quad \frac{\left(\frac{a^{-1}b^2}{(a^2b)^{-3}}\right)^2}{(2a)^2 b \left[\frac{(2a^2b)}{(ab)^3 \left(\frac{2^2a}{b^{-1}}\right)^{-2}} \right]}$$

$$= \frac{\frac{a^{-2}b^4}{a^4b^{-6}}}{2^2 a^2 b \left[\frac{2a^2b}{a^3 b^3 \left(\frac{2^{-4}a^{-2}}{b^2}\right)} \right]}$$

$$= \frac{\frac{b^{10}}{a^6}}{2^2 a^2 b \left[\frac{2a^2b}{ab 2^{-4}} \right]}$$

$$= \frac{\frac{b^{10}}{a^6}}{2^7 a^3 b} = \frac{b^{10}}{a^6} \cdot \frac{1}{2^7 a^3 b}$$

$$= \boxed{\frac{b^9}{2^7 a^9}}$$