Principles of Algebra Name/Date Clee / Today

ALL PROBLEMS CAN BE COMPLETED ON THIS WORKSHEET

WS 10D.1 – Negative and Zero Exponents

#1-3, Evaluate each expression for $a = -2$, $b = 3$, $c = -5$. Easiest to simplify FIRST.

1. $(a^2c)^3$

$= a^6c^3$

$= (-2)^6(-5)^3$

$= 64 \cdot (-125)$

$= \boxed{-8000}$

2. $(-a^2b^3c^3)^2$

$= 1a^4b^6c^6$

$= (-2)^4(3)^6(-5)^6$

$= 16 \cdot 729 \cdot 15625$

$= \boxed{182,250,000}$

3. $(a^2c)^{-3}$

$= \frac{1}{(a^2c)^3}$

$= \frac{1}{a^6c^3}$

$= \frac{1}{(-2)^6(-5)^3}$

$= \frac{1}{64 \cdot (-125)} = \boxed{-\frac{1}{8000}}$

#4-12, Simplify. Answers must not contain zero or negative exponents.

4. $\frac{w^0y^2z^{-1}}{1}$

$= \frac{1 \cdot y^2}{z^1}$

$= \boxed{\frac{y^2}{z}}$

5. $(-x^{-3}y^4)^2$

$= 1x^{-6}y^8$

$= \boxed{\frac{y^8}{x^6}}$

6. $(xy^2z^0)^3(x^{-5}y^{-2}z^{-8})^2$

$= x^3y^6 \cdot 1 \cdot x^{-10}y^{-4}z^{-16}$

$= x^{-7}y^2z^{-16}$

$= \boxed{\frac{y^2}{x^7z^{16}}}$

7. $\frac{-3a^3b^{-5}}{-9a^{-3}b^9} = \frac{1a^3a^3}{3b^9b^5}$

$= \boxed{\frac{1a^6}{3b^{14}}}$

8. $\frac{-2d^{-8}e^{-4}}{6d^{-10}e^{-1}} = \frac{-1d^{10}e^1}{3d^8e^4}$

$= \boxed{\frac{-1d^2}{3e^3}}$

9. $\dfrac{(2r^2)^3 8r^6}{4r^{-3}} = \dfrac{8r^6 \cdot 8r^6}{4r^{-3}}$

$= \dfrac{64r^{12}}{4r^{-3}}$

$= \dfrac{16r^{12}r^3}{1}$

$= \boxed{16r^{15}}$

10. $\left[\dfrac{(a^3b^5)^2}{a^5b^2}\right]^{-1} = \left[\dfrac{a^6b^{10}}{a^5b^2}\right]^{-1}$

$= (ab^8)^{-1}$

$= \boxed{\dfrac{1}{ab^8}}$

11. $\left(\dfrac{z^{-3}}{4t}\right)^{-3}\left(\dfrac{5t}{z^{-7}}\right)^{-2}$

$= \left(\dfrac{1}{4tz^3}\right)^{-3}\left(\dfrac{5tz^7}{1}\right)^{-2}$

$= \left(\dfrac{4tz^3}{1}\right)^{3} \cdot \left(\dfrac{1}{5tz^7}\right)^{2}$

$= \dfrac{64t^3z^9}{1} \cdot \dfrac{1}{25t^2z^{14}}$

$= \dfrac{64t^3z^9}{25t^2z^{14}}$

$= \boxed{\dfrac{64t}{25z^5}}$

12. $\left[\left(\dfrac{x^5y^2}{x^{-3}y}\right)^{-2}\left(\dfrac{y^{-3}}{2x^5}\right)^{3}\right]^{-1}$

$= \left[\dfrac{x^{-10}y^{-4}}{x^6y^{-2}} \cdot \dfrac{y^{-9}}{8x^{15}}\right]^{-1}$

$= \left[\dfrac{x^{-10}y^{-13}}{8x^{21}y^{-2}}\right]^{-1}$

$= \left[\dfrac{1}{8x^{31}y^{11}}\right]^{-1}$

$= \boxed{8x^{31}y^{11}}$