

Advanced Algebra

Name _____ hr _____

Exponent Rules and Shortcuts Practice BLUE 2018 –

MULTIPLYING LIKE BASES

Shortcut: $b^m b^n = b^{m+n}$

DIVIDING LIKE BASES

Shortcut: $\frac{b^m}{b^n} = b^{m-n}$

PARENTHESIS EXPONENTS

Shortcut: $(ab)^n = a^n b^n$ and $(b^m)^n = b^{m \cdot n}$

NEGATIVE EXPONENTS

Shortcuts: $b^{-m} = \frac{1}{b^m}$ and $\frac{a^{-n}}{b^{-m}} = \frac{b^m}{a^n}$

ZERO EXPONENTS

Shortcut: $b^0 = 1$ **Use two of the rules together to simplify these expressions.**

1. $(2x^2)^2 x^5$

6. $a^5 b^7 c^3 a^{-4} b^3 c^{-7}$

2. $(a^3 b^2)^7 ab^3$

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

3. $\frac{(a^3 b^2)^7}{ab^3}$

8. $(a^4 b^9)^{-10}$

4. $\frac{(2x^2)^2}{x^5}$

9. $\left(\frac{a^6}{2b}\right)^3$

5. $x^{-1} y^2 z^3 x^{-2} y^3 z^7$

10. $\frac{4w^{-11} y^{-3}}{16w^{-51} y^7}$

All Together Now – remember what third (& fifth) roots means!

1. $\sqrt[3]{54x^6y^9}$

7. $\frac{x^2y^{-3}z^{-1}}{\left(a^{\frac{2}{5}}b^{\frac{1}{5}}c^{\frac{3}{5}}\right)^{10}}$

2. $\left(\frac{b^xb^{3x}}{b^3}\right)^2$

8. $\frac{27x^3 \cdot 63x^5}{9x^2}$

3. $2^{3k+1}4^{k-1}$

9. $\frac{27x^3 - 63x^5}{9x^2}$

4. $\left(x^{\frac{1}{2}}y^{\frac{1}{5}}\right)^{20}$

10. $\sqrt{f}(f^{3.5} - 2f^{1.5})$

5. $(6^5\sqrt{6})(\sqrt{6^3})$

11. $\sqrt{f}(f^{3.5} \cdot 2f^{1.5})$

6. $\frac{a^2b^{\frac{1}{3}}c^{-1}}{a^{\frac{1}{2}}b^{\frac{4}{3}}c^2}$