

Algebra
Simplifying Exponents Homework

Name: _____
Date: _____ Block: _____

Simplify each of the following exponential expressions

1. $5m^{-3}n^{-4}$

$$\frac{5}{m^3 n^4}$$

2. $\frac{1}{8x^{-2}y^{-6}}$

$$\frac{x^2 y^6}{8}$$

3. $\frac{(3x)^{-3}y^4}{x^2y^{-6}}$

$$\frac{3^{-3}x^{-3}y^4}{x^2y^{-6}}$$

$$\frac{y^4 y^6}{27x^3 x^2} = \frac{y^{10}}{27x^5} \text{ or } \frac{y^{10}}{3^3 x^5}$$

4. $(-11h)^{-2}$

$$(-11)^{-2} h^{-2}$$

$$\frac{1}{|21 h^2|} \text{ or } \frac{1}{(-11)^2 h^2}$$

 ↑
 need parentheses

5. $\frac{9}{(3d)^{-3}}$

$$\frac{9}{3^{-3}d^{-3}}$$

$$243d^3$$

 or

$$9(3^3 d^3)$$

6. $(8c^5)^{-2}$

$$8^{-2} c^{-10}$$

$$\frac{1}{64c^{10}} \text{ or } \frac{1}{8^2 c^{10}}$$

7. $(-3h^9)^{-3}$

$$(-3)^{-3} h^{-27}$$

$$\frac{1}{-27h^{27}} \text{ or } \frac{1}{(-3)^3 h^{27}}$$

 ↑
 * parentheses

8. $(k^9)^5(k^{-3})^2$

$$k^{45} k^{-6}$$

$$\frac{k^{45}}{k^6} = k^{39}$$

9. $(4h^{-3})^{-2}(-2g^{-3}h)^{-3}$

$$4^{-2} h^6 (-2)^3 g^9 h^{-3}$$

$$\frac{h^6 g^9}{16 \cdot -8 h^3} = \frac{g^9 h^3}{-128}$$

 or

$$\frac{g^9 h^3}{(-2)^3 \cdot 4^2}$$

 ↑
 parentheses

10. $\left(\frac{x^{-3}}{y^2}\right)^{-6}$

$$\frac{x^{18}}{y^{-12}}$$

$$x^{18} y^{12}$$

11. $\left(\frac{5c}{d^2}\right)^{-2}$

$$\frac{5^{-2} c^{-2}}{d^{-4}}$$

$$\frac{d^4}{25c^2} \text{ or } \frac{d^4}{5^2 c^2}$$

12. $\left(\frac{4d^{-3}}{c^5}\right)^{-3}$

$$\frac{4^{-3} d^9}{c^{-15}}$$

$$\frac{c^{15} d^9}{64} \text{ or } \frac{c^{15} d^9}{4^3}$$

Simplify each of the following exponential expressions

13. $\frac{4.2x^4y^{14}}{0.6x^9y^7}$

must simplify!

$$\frac{7y^7}{x^5}$$

14. $\left(\frac{7d^2}{14d^{-4}}\right)^{-3}$

$$\frac{7^{-3}d^{-6}}{14^{-3}d^{12}} = \frac{14^3}{7^3d^{18}}$$

$$\frac{8}{d^{18}} \text{ or } \frac{14^3}{7^3d^{18}}$$

15. $\left(\frac{2d^4}{4e}\right)^{-3}$

$$\frac{2^{-3}d^{-12}}{4^{-3}e^{-3}}$$

$$\frac{4^3e^3}{2^3d^{12}}$$

$$\frac{8e^3}{d^{12}} \text{ or } \frac{4^3e^3}{2^3d^{12}}$$

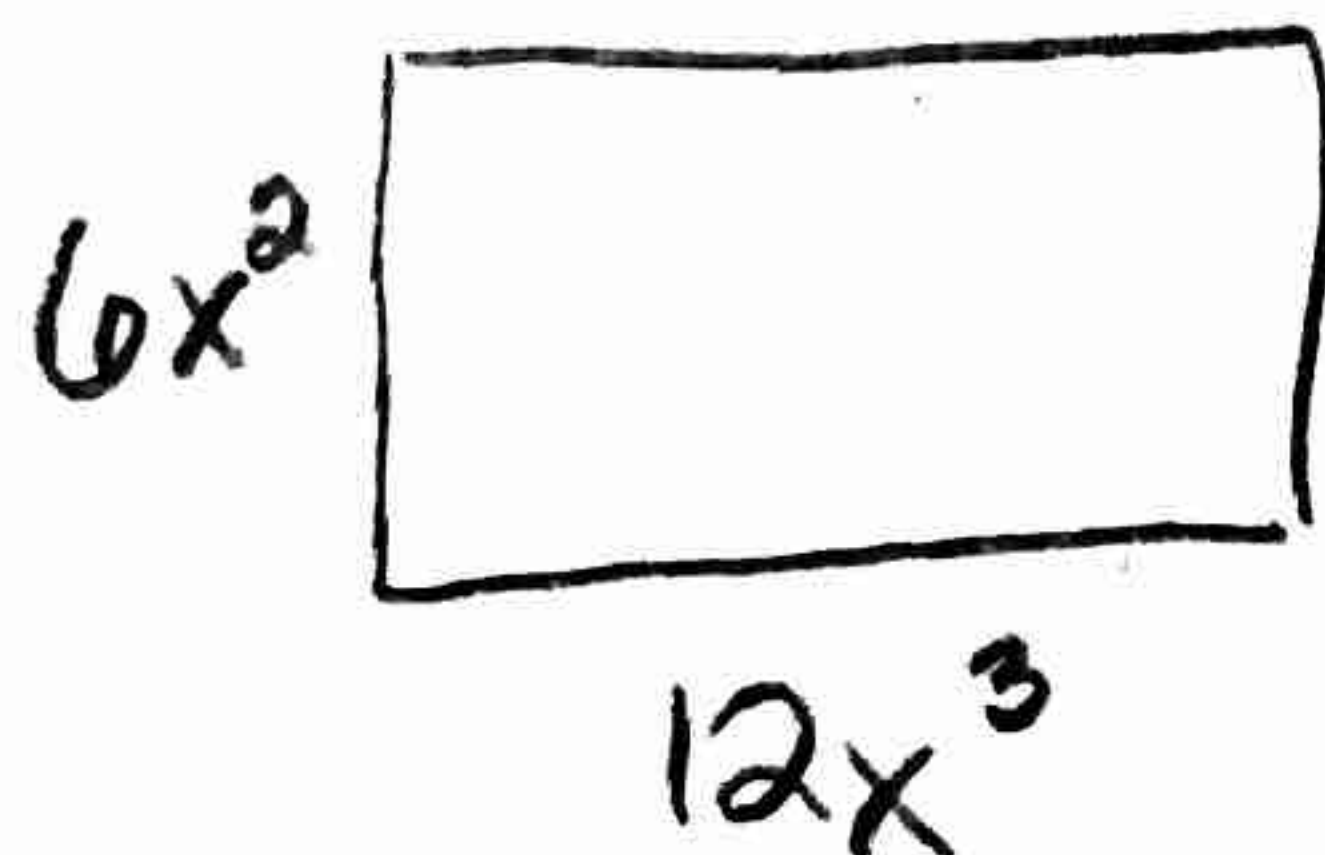
16. $(4a^4b^{-6})^{-2}(a^{-6}c^{-3})^{-2}$

$$4^{-2}a^{-8}b^{12}a^{12}c^6$$

$$\frac{a^4b^{12}c^6}{16}$$

$$\text{or } \frac{a^4b^{12}c^6}{4^2}$$

17. What is the area of the rectangle with the width of $6x^2$ and the length $12x^3$?



$$A = l \cdot w$$

$$A = 12x^3 \cdot 6x^2$$

$$A = 72x^5 \text{ units}^2$$

↑
don't forget label!

18. Which expression simplifies to $2x^4$?

~~A.~~ $2x^{-4}$

~~B.~~ $\frac{32}{(2x)^{-4}} = \frac{32}{2^{-4}x^{-4}}$

~~C.~~ $\frac{1}{2x^{-4}} = \frac{x^4}{2}$

D. $\frac{8}{4x^{-4}} = 2x^4$

19. Which expression is equivalent to $(-4 \cdot 2^0 \cdot 3)^{-2}$?

~~A.~~ -12 $(-4)^{-2} \cdot 1 \cdot 3^{-2}$

~~B.~~ $-\frac{1}{144}$

~~C.~~ 0

D. $\frac{1}{144}$

$$\frac{1}{16} \cdot 1 \cdot \frac{1}{9}$$