

Advanced Algebra
Homework 4.2
Exponent Rules/Properties

Name _____

Period _____

SHOW ALL WORK.

Complete Parts A & B OR Parts B & C

PART A:

Write the answer in scientific notation.

1. $(4.2 \times 10^3)(1.5 \times 10^6)$

2. $(1.2 \times 10^{-3})(6.7 \times 10^{-7})$

3. $(6.3 \times 10^5)(8.9 \times 10^{-12})$

Simplify the expression. Write your final answer *without* negative exponents.

4. $\frac{w^{-2}}{w^6}$

5. $(2^2 y^3)^5$

6. $(p^3 q^2)^{-1}$

Describe and correct the error in simplifying the expression.

7. $\frac{x^{10}}{x^2} = x^5$

8. $x^5 \cdot x^3 = x^{15}$

9. $(-3)^2(-3)^4 = 9^6$

PART B:

Write the answer in scientific notation.

10. $(2.1 \times 10^{-4})^3$

11. $\frac{(1.1 \times 10^{-3})}{(5.5 \times 10^{-8})}$

Simplify the expression. Write your final answer *without* negative exponents.

12. $(w^3x^{-2})(w^6x^{-1})$

13. $(5s^{-2}t^4)^{-3}$

14. $(3a^3b^5)^{-3}$

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

16. $\frac{3c^3d}{9cd^{-1}}$

17. $\frac{4r^4s^5}{24r^4s^{-5}}$

18. $\frac{2a^3b^{-4}}{3a^5b^{-2}}$

19. $\frac{y^{11}}{4z^3} \cdot \frac{8z^7}{y^7}$

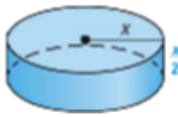
20. $\frac{x^2y^{-3}}{3y^2} \cdot \frac{y^2}{x^{-4}}$

Write an expression for the figure's area or volume in terms of x.

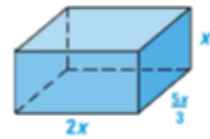
21. $A = \frac{\sqrt{3}}{4} s^2$



22. $V = \pi r^2 h$



23. $V = wh$



Write an expression that makes the statement true.

24. $x^{15}y^{12}z^8 = x^4y^7z^{11} \cdot ?$

25. $3x^3y^2 = \frac{12x^2y^5}{?}$

26. $(a^5b^4)^2 = a^{14}b^{-1} \cdot ?$

27. The continents of earth move at a very slow rate. The South American continent has been moving about 0.000022 miles per year for the past 125,000,000 years. How far has the continent moved in that time? Write your answer in scientific notation.

PART C:

Write the answer in scientific notation

28.
$$\frac{(7.5 \times 10^8)(4.5 \times 10^{-4})}{1.5 \times 10^7}$$

29. A can of tennis balls consists of three spheres of radius r stacked vertically inside a cylinder of radius r and height h .

a) Write an expression for the total volume of the three tennis balls in terms of r .

b) Write an expression for the volume of the cylinder in terms of r and h .

c) Write an expression for h in terms of r using the fact that the height of the cylinder is the sum of the diameters of the three tennis balls.

d) What fraction of the can's volume is taken up by the tennis balls?

Homework 4.2

1. 6.3×10^9 2. 8.04×10^{-10} 3. 5.607×10^{-6}

4. $\frac{1}{w^8}$ 5. $1024y^{15}$ 6. $\frac{1}{p^3q^2}$

7. Exponents should be subtracted, not divided. x^8

8. Exponents should be added, not multiplied. x^8

9. The base should not change. $(-3)^6$

10. 9.261×10^{-12} 11. 2×10^4 12. $\frac{w^9}{x^3}$

13. $\frac{s^6}{125t^{12}}$ 14. $\frac{1}{27a^9b^{15}}$ 15. $\frac{y^3}{x^3}$ 16. $\frac{c^2d^2}{3}$ 17. $\frac{s^{10}}{6}$ 18. $\frac{2}{3a^2b^2}$ 19. $2y^4z^4$

20. $\frac{x^6}{3y^3}$ 21. $\frac{x^2\sqrt{3}}{36}$ 22. $\frac{\pi x^3}{2}$ 23. $\frac{10x^3}{3}$ 24. $x^{11}y^5z^{-3}$ 25. $4x^{-1}y^3$ 26. $a^{-4}b^9$

27. 2.75×10^3 miles

28. 2.25×10^{-2}

29a. $4\pi r^3$

29b. $\pi r^2 h$

29c. $6r$

29d. $\frac{2}{3}$