

Simplify.

1. $2^3 \cdot 2^5$

2. $6^4 \cdot 6^1$

3. $5^6 \cdot 5^{-2}$

4. $t^{-4} \cdot t^{-5}$

5. $x^4 \cdot x^2$

6. $s^4 \cdot s^6 \cdot t^3$

7. $(2^4)^2$

8. $(m^4)^0$

9. $(y^{-2})^{-4}$

10. $m^4 \cdot (n^2)^3 \cdot n^{-2}$

11. $y \cdot x^3 \cdot (y^2)^2 \cdot (x^3)^6$

12. $(4x)^3$

13. $(gh)^{-1}$

14. $-(3bc)^2$

15. $(j^2 k^3)^3$

16. $(5d)^2 \cdot d^4$

17. $(3xy^3)^{-2} \cdot (9y)^2$

18. $(r^{-3} s^4)^2 \cdot (r^2 s^7)^0$

19. $(a^2 b^{-2})^{-3} \cdot (a^{-1} b^2)^{-3}$

20. $(x^3 y^{-1})^4 \cdot (x^{-2} y^2)^{-3}$

21. $-(j^{-3} k^{-2})^2 \cdot (j^2)^6$

Find the missing exponent in each expression.

22. $b^{\square} \cdot b^5 = b^9$

23. $(t^{\square})^4 = t^{12}$

24. $(h^3)^{\square} = \frac{1}{h^6}$

25. Most states are irregularly shaped. However, the shapes of some western states approximate rectangles. Wyoming is nearly rectangular, with a width of about 1.5×10^6 feet and a length of about 1.9×10^6 feet. What is the approximate area of Wyoming? Write your answer in scientific notation.
- _____

Simplify.

1. $\frac{6^7}{6^5} = 6^{7-5} = 6^{\square} =$ _____

2. $\frac{t^{12}}{t^7} = t^{\square} - \square =$ _____

3. $\frac{w^9}{w^2}$

4. $\frac{j^2}{j^8}$

5. $\frac{20m^5}{4m^2}$

6. $\frac{c^3 d^2}{c^2 d^5}$

7. $\frac{(x^4)^2}{(x^3)^5}$

8. $\left(\frac{s^3 t}{st^4}\right)^2$

9. $\left(\frac{2}{3}\right)^{-3}$

10. $\left(\frac{3a}{2b}\right)^{-4}$

11. $-\left(\frac{-t}{3v}\right)^{-4}$

12. $\left(\frac{6}{7}\right)^{-2} \cdot \left(\frac{4s}{6t}\right)^{-2}$

13. $\left(\frac{3c}{-2}\right)^{-1} \left(\frac{d}{4}\right)^{-2}$

14. $\left(\left(\frac{3mn}{2}\right)^{-1}\right)^{-4}$

Simplify. Write the answer in scientific notation.

15. $(3.8 \times 10^5) \div (1.9 \times 10^{-6})$

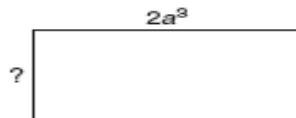
16. $(2.5 \times 10^3) \div (5 \times 10^{-4})$

17. A textile factory produces 1.08×10^8 yards of fabric every year. If the factory is in operation 360 days a year, what is the average number of yards of fabric produced each day? Give your answer in standard form.

18. It takes 5 yards of fabric to manufacture a dress. If the textile factory turned their entire yearly production of 1.08×10^8 yards of fabric into dresses, how many could they make? Give your answer in scientific notation.

1.

A rectangular parking lot has an area of $10a^3b^6$ square yards. What is the width of the parking lot?



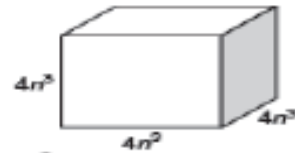
- A $5b^2$ yards C $5b^6$ yards
 B $5b^3$ yards D $25b^6$ yards

The wavelengths of electromagnetic radiation vary greatly. Green light has a wavelength of about 5.1×10^{-7} meters. The wavelength of a U-band radio wave is 2.0×10^{-2} meters. About how much greater is the wavelength of a U-band radio wave than that of green light?

- A 2.55×10^{-9} C 3.92×10^4
 B 2.55×10^{-5} D 3.92×10^5

4.

What is the volume of the cube shown below?



- F $12n^6 \text{ in}^3$ H $64n^9 \text{ in}^3$
 G $12n^9 \text{ in}^3$ J $256n^9 \text{ in}^3$

2.

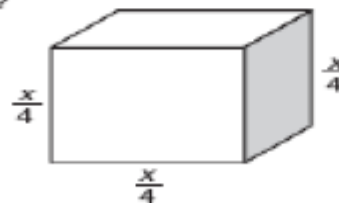
The formula for the volume of a cylinder is $V = \pi r^2 h$ where r is the radius and h is the height. What is the volume of the cylinder shown below?



- A $12\pi xy \text{ cm}^3$ C $18\pi x^2 y \text{ cm}^3$
 B $12\pi xy^2 \text{ cm}^3$ D $36\pi xy^2 \text{ cm}^3$

5.

A storage chest is shaped like a cube. What is the volume of the storage chest?



- F $\frac{x^3}{64}$ cubic units H $\frac{32}{x^3}$ cubic units
 G $\frac{x^3}{32}$ cubic units J $64x^3$ cubic units

3.

Belize borders Mexico and Guatemala in Central America. It has an area of 2.30×10^4 square kilometers. Russia borders fourteen countries and is 7.43×10^2 times larger than Belize. What is the area of Russia?

- A $1.71 \times 10^6 \text{ sq km}$ C $1.71 \times 10^8 \text{ sq km}$
 B $1.71 \times 10^7 \text{ sq km}$ D $1.71 \times 10^9 \text{ sq km}$

6.

5.32×10^3 square miles and a population of 3.89×10^6 . What is the population density of Puerto Rico in persons per square mile?

- F 1.37×10^{-2} H 7.31×10^2
 G 1.37×10^{-2} J 7.31×10^2

Find the degree and number of terms of each polynomial.

1. $14h^3 + 2h + 10$

2. $7y - 10y^2$

3. $2a^2 - 5a + 34 - 6a^4$

Write each polynomial in standard form. Then, give the leading coefficient.

4. $3x^2 - 2 + 4x^8 - x$

5. $7 + 50j - 3j^3 - 4j^2$

6. $6k + 5k^4 - 4k^3 + 3k^2$

Classify each polynomial by its degree and number of terms.

7. $-5t^2 + 10$

8. $8w + 32 + 9w^4$

9. $b - b^3 - 2b^2 + 5b^4$

Evaluate each polynomial for the given value.

10. $3m + 8 - 2m^3$ for $m = -1$

11. $4y^5 - 6y + 8y^2 - 1$ for $y = -1$

12. $2w + w^3 - \frac{1}{2}w^2$ for $w = 2$

13. An egg is thrown off the top of a building. Its height in meters above the ground can be approximated by the polynomial $300 + 2t - 4.9t^2$, where t is the time since it was thrown in seconds.

a. How high is the egg above the ground after 5 seconds?

b. How high is the egg above the ground after 6 seconds?
