

Algebra 1B
Chapter 8 Review: Exponents

Name KEY
Block _____ Date _____

Calculator NOT Allowed

Write each number in scientific notation.

1. 7,300,000,000
 7.3×10^9

2. 0.00407
 4.07×10^{-3}

3. 950×10^5
 9.50×10^7

Write each number in standard notation.

4. 5.78×10^{-6}
.00000578

5. 1.98×10^7
19,800,000

6. 6.4753×10^3
6475.3

Arrange the numbers in order from least to greatest.

7. 6.4×10^{-3} , 8.1×10^0 , 2.7×10^{-3} , 1.3×10^5
 2.7×10^{-3} , 6.4×10^{-3} , 8.1×10^0 , 1.3×10^5

Simplify.

8. $2^{-4} = \frac{1}{2^4} = \boxed{\frac{1}{16}}$

9. $5^4 \cdot 5^{-6} = 5^{4+(-6)} = 5^{-2}$
 $= \frac{1}{5^2}$
 $= \boxed{\frac{1}{25}}$

10. $7x^{-3}y^4z^{-8} = \boxed{\frac{7y^4}{x^3z^8}}$

11. $(b^{-7}c^0)(b^3) = b^{-4}$
 $= \boxed{\frac{1}{b^4}}$

12. $\left(\frac{3}{5}\right)^{-2} = \left(\frac{5}{3}\right)^2 = \boxed{\frac{25}{9}}$

13. $(-2)^3(-3)^{-2}$
 $(-8) \left(\frac{1}{c^2}\right) = -8 \cdot \frac{1}{9} = \boxed{\frac{-8}{9}}$

14. $x^{-9} \cdot x^3 \cdot x^1 = x^{-9+3+1} = x^{-5}$
 $= \boxed{\frac{1}{x^5}}$

15. $(-8p^4)(5p^9)(2p)$
 $= -80p^{4+9+1} = \boxed{-80p^{14}}$

16. $2c^2 \cdot d^{-6} \cdot c^7 \cdot 5d^6 = 10c^{2+7}d^{-6+6}$
 $= 10c^9d^0$
 $= \boxed{10c^9}$

17. $(5a^4b^5)^3 = 5^3 a^{12} b^{15}$
 $= \boxed{125a^{12}b^{15}}$

18. $n^6(n^{-2})^5 = n^6 \cdot n^{-10}$
 $= \boxed{n^{-4}}$

19. $\frac{3^8}{3^5} = 3^{8-5} = 3^3 = \boxed{27}$

$$20. (2a^3bc^4)^2(3ab^3)^2$$

$$2^2a^6b^2c^8 \cdot 3^2a^2b^6$$

$$4a^6b^2c^8 \cdot 9a^2b^6$$

$$\boxed{36a^8b^8c^8}$$

$$21. (3f^4g^{-3})^3(f^2g^{-2})^{-1}$$

$$3^3f^{12}g^{-9} \cdot f^{-2}g^2$$

$$27f^{10}g^{-7} = \boxed{\frac{27f^{10}}{g^7}}$$

$$22. \frac{r^3s^{-1}}{r^2s^6} = \frac{r^3}{r^2s^1s^6} = \boxed{\frac{r}{s^7}}$$

$$23. \left(\frac{c^2d^{-3}}{c^{-7}d^6e^{-5}}\right)^0 = 1$$

$$24. \left(\frac{m^{-3}n^4}{n^{-2}}\right)^4 = \frac{m^{-12}n^{16}}{n^{-8}}$$

$$= \frac{n^8n^{16}}{m^{12}}$$

$$= \boxed{\frac{n^{24}}{m^{12}}}$$

$$25. \frac{12x^4y^{-7}z^5}{15x^9y^{-3}z^{-1}} = \frac{4}{5} \frac{y^3z^5z^1}{x^5y^4}$$

$$= \boxed{\frac{4z^6}{5x^5y^4}}$$

Evaluate.

$$26. 4x^2y^{-3} \text{ when } x=4 \text{ and } y=-2$$

$$\frac{4x^2}{y^3} \Rightarrow \frac{4(4)^2}{(-2)^3} = \frac{4 \cdot 16}{-8} = \boxed{-8}$$

$$27. \frac{1}{ab^{-2}} \text{ when } a=-3 \text{ and } b=6$$

$$\frac{b^2}{a} = \frac{(6)^2}{(-3)} = \frac{36}{-3} = \boxed{-12}$$

Simplify. Write each answer in scientific notation.

$$28. 7(9 \times 10^6) = 63 \times 10^6$$

$$= \boxed{6.3 \times 10^7}$$

$$29. 4(0.2 \times 10^{-4}) = .8 \times 10^{-4}$$

$$= \boxed{8.0 \times 10^{-5}}$$

$$30. (2.1 \times 10^4)(8 \times 10^7)$$

$$16.8 \times 10^{11}$$

$$= \boxed{1.68 \times 10^{12}}$$

$$31. (5 \times 10^8)(2.6 \times 10^{-13})$$

$$13.0 \times 10^{-5}$$

$$= \boxed{1.3 \times 10^{-4}}$$

$$32. (3 \times 10^5)^4 = 3^4 \times 10^{20}$$

$$= 81 \times 10^{20}$$

$$= \boxed{8.1 \times 10^{21}}$$

$$33. (5 \times 10^{-6})^2 = 5^2 \times 10^{-12}$$

$$= 25 \times 10^{-12}$$

$$= \boxed{2.5 \times 10^{-11}}$$

$$34. \frac{60 \times 10^{-7}}{5 \times 10^{-2}} = 12 \times 10^{-5}$$

$$= \boxed{1.2 \times 10^{-4}}$$

$$35. \frac{4.9 \times 10^{11}}{7 \times 10^3} = .7 \times 10^8$$

$$= \boxed{7.0 \times 10^7}$$

36. Each square inch of your body has about 6.5×10^2 pores. Suppose the back of your hand has an area of about $0.1 \times 10^2 \text{ in}^2$. How many pores would be on the back of your hand? Write your answer in scientific notation.

$$(6.5 \times 10^2)(0.1 \times 10^2) = 0.65 \times 10^4$$

$$= \boxed{6.5 \times 10^3}$$

37. The half-life of uranium-238 is 5×10^9 years. The half-life of uranium-234 is 2.5×10^5 years. How many times greater is the half-life of uranium-238 than that of uranium-234? Write your answer in scientific notation.

$$\frac{5 \times 10^9}{2.5 \times 10^5} = \boxed{2 \times 10^4}$$

Previous Chapter Review
(Graphing Calculator Allowed)

38. Solve the following system of equations using elimination:
- $$\begin{cases} 3x - 4y = -27 \\ 2x + 3y = -1 \end{cases} \Rightarrow \begin{array}{r} 9x - 12y = -81 \\ 8x + 12y = -4 \\ \hline 17x = -85 \\ x = -5 \end{array}$$

$$\boxed{(-5, 3)}$$

$$\begin{aligned} 3(-5) - 4y &= -27 \\ -15 - 4y &= -27 \\ -4y &= -12 \\ y &= 3 \end{aligned}$$

39. Solve using substitution:
- $$\begin{cases} 2x + 4y = -6 \\ x = 3y + 7 \end{cases}$$

$$\begin{aligned} 2(3y + 7) + 4y &= -6 \\ 6y + 14 + 4y &= -6 \\ 10y + 14 &= -6 \\ 10y &= -20 \\ y &= -2 \end{aligned}$$

$$\begin{aligned} x &= 3(-2) + 7 \\ x &= -6 + 7 \\ x &= 1 \end{aligned}$$

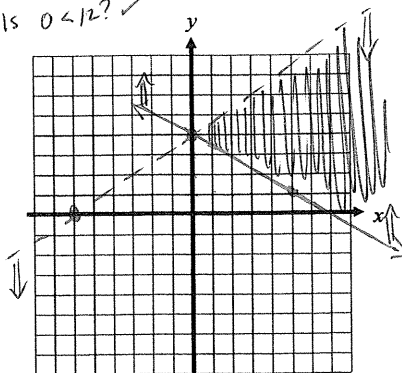
$$\boxed{(1, -2)}$$

40. Graph the system of inequalities:

$$\begin{cases} -2x + 3y < 12 \\ y \geq -\frac{3}{5}x + 4 \end{cases}$$

$$\begin{array}{r} x \ y \\ 0 \ 0 \\ -6 \ 0 \end{array}$$

Is $0 < 12$? ✓



41. Use the points (7, -2) and (5, 8).

a) Find the slope between the two points.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - (-2)}{5 - 7} = \frac{10}{-2} = -5$$

b) Write the equation of the line in point-slope form that goes through those two points.

$$\boxed{y - 8 = -5(x - 5)} \quad \text{OR} \quad \boxed{y + 2 = -5(x - 7)}$$

c) Write the equation of the line in slope-intercept form that goes through those two points.

$$y - 8 = -5x + 25$$

$$\boxed{y = -5x + 33}$$

$$y + 2 = -5x + 35$$

$$\boxed{y = -5x + 33}$$

d) Write the equation of the line in standard form that goes through those two points.

$$\boxed{5x + y = 33}$$