Chapter 8 Test Review Packet

Name: KEY

Simplify each expression as much as possible. (Numbers should *NOT* have exponents!)

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

5^{3+5}

5^8

390625

2. $(3^3)^2$

$3^{3 \cdot 2}$

3^6

729

3. $\left(\frac{3}{5}\right)^2$

$\frac{3^2}{5^2}$

$\frac{9}{25}$

4. $\frac{4^5}{4^7}$

4^{5-7}

4^{-2}

$\frac{1}{4^2}$ $\frac{1}{16}$

5. $\left(\frac{1}{4}\right)^{-1}$

$\frac{1^{-1}}{4^{-1}}$

$\frac{4^1}{1^1}$ 4

6. 6^{-2}

$\frac{1}{6^2}$

$\frac{1}{36}$

Simplify each expression as much as possible. Write your answer using only positive exponents.

7. $(5a)^3$

$5^3 a^3$

$125a^3$

8. $(3xy^2)^2$

$3^2 x^2 y^4$

$9x^2y^4$

9. $(x^3)^6$

$x^{3 \cdot 6}$

x^{18}

10. $\left(\frac{4}{x}\right)^3$

$\frac{4^3}{x^3}$

$\frac{64}{x^3}$

11. $\frac{x^6}{x^2}$

x^{6-2}

x^4

12. x^{-5}

$\frac{1}{x^5}$

13. $\frac{1}{2x^{-2}}$

$\frac{x^2}{2}$

14. $4x^{-3}y$

$\frac{4y}{x^3}$

15. $(2x^{-1}y)^2$

$2^2 x^{-2} y^2$

$\frac{4y^2}{x^2}$

Rewrite the number in standard notation.

16. 8.2×10^5

820000

820,000

17. 6.03×10^4

60300

60,300

18. 4.51×10^{-3}

.00451

0.00451

Rewrite the number in scientific notation.

19. 0.002

2.0×10^{-3}

20. 1153

1.153×10^3

21. 3,146,000

3.146×10^6

Simplify the expression. Write the answer in scientific notation.

22. $(3 \times 10^{-2}) \cdot (12 \times 10^3)$

$(3 \times 12) \times 10^{-2+3}$

36×10^1

3.6×10^2

23. $\frac{(24 \times 10^3)}{(2 \times 10^{-6})}$

$(\frac{24}{2}) \times 10^{3-(-6)}$

12×10^9

1.2×10^{10}

24. A family purchased a house for \$60,000. Each year the value of the house increased by 4%.

a. Write a model that represents the value of the house over time.

growth

$y = C(1+r)^t$

$y = 60{,}000(1+0.04)^t$

$\boxed{y = 60{,}000(1.04)^t}$

b. Find the value of the house after 8 years.

$y = 60{,}000(1.04)^8$

$y \approx \boxed{\$82{,}114.14}$

25. You buy a used car for \$12,000. It depreciates at a rate of 13% per year.

a. Write a model that represents the value of the car over time.

decay

$y = C(1-r)^t$

$y = 12{,}000(1-0.13)^t$

$\boxed{y = 12{,}000(0.87)^t}$

b. Find the value of the car after 4 years.

$y = 12{,}000(0.87)^4$

$y \approx \boxed{\$6{,}874.77}$

Tell whether the model is an exponential growth or exponential decay.

26. $y = 16(1.08)^t$

growth

8%

27. $y = 440(0.7)^t$

decay

30%

$0.7 = 1 - r$

$-0.3 = -r$

$r = 0.3$

28. $y = 60{,}000(2)^t$

growth

100%

What is growth/decay rate (%) for each?