Name Key Period

Algebra Chapter 7 Review

Simplify.

1. $(3a^2b^5)(-2ab^3)$

1. $-6a^3b^8$

2. $(w^3z^7)^3$

2. w^9z^{21}

3. $(4a^4b^8)(2ab^2)^4(a^2b^4)^2$

$(4a^4b^8)(16a^4b^8)(a^4b^8)$

3. $64a^{12}b^{24}$

Simplify. Assume that no denominator is equal to zero.

4. $\frac{4a^{-3}d^2}{8a^2d^{-5}}$

4. $\frac{d^7}{2a^5}$

5. $\frac{(3r^3t^5)^3}{(-3r^2t^7)^2} = \frac{27r^9t^{15}}{9r^4t^{14}}$

5. $3r^5t$

6. Express 0.00000402 in scientific notation.

6. $4.02 * 10^{-6}$

Evaluate each product or quotient. Express the results in both scientific notation and standard form.

7. $(4.6 \times 10^3)(9.12 \times 10^{-7})$

$(4.6 * 9.12)(10^3 * 10^{-7})$

$= 41.952 * 10^{-4}$

7. Scientific: $4.1952 * 10^{-3}$

Standard: .0041952

8. $\frac{1.6 \times 10^{-3}}{8 \times 10^{-7}}$ $\left(\frac{1.6}{8}\right)\left(\frac{10^{-3}}{10^{-7}}\right) = .2 * 10^4$

8. Scientific: $2.0 * 10^3$

Standard: 2,000

Solve each equation.

9. $125^{x-1} = 5$

$5^{3(x-1)} = 5^1$ $\quad 3(x-1) = 1$

$3x - 3 = 1$

$3x = 4 \Rightarrow x = 4/3$

9. $4/3$

10. $3^{3x+1} = 81$

$3^{3x+1} = 3^4$ $\quad 3x+1 = 4$

$3x = 3$

$x = 1$

10. 1

11. $64^{2x+3} = 2$

$2^{6(2x+3)} = 2^1$ $\quad 6(2x+3) = 1$

$12x + 18 = 1$

$12x = -17$

$x = -17/12$

11. $-17/12$

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Simplify.

12. $1000^{\frac{2}{3}}$ $= (1000^{1/3})^2 = (10)^2$

13. $4^{\frac{5}{2}}$ $= (4^{1/2})^5 = 2^5 = 32$

Write each expression in radical form.

14. $57^{\frac{1}{4}}$

15. $10x^{\frac{1}{3}}$

12. 100

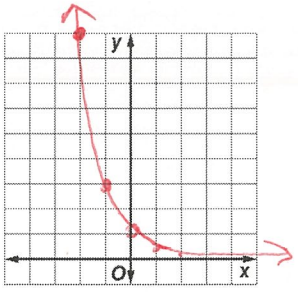
13. 32

14. $\sqrt[4]{57}$

15. $10\sqrt[3]{x}$

16. Graph $y = (\frac{1}{3})^x$. Find the y-intercept and state the domain and range.

x	y
-2	9
-1	3
0	1
1	1/3
2	1/9



16.

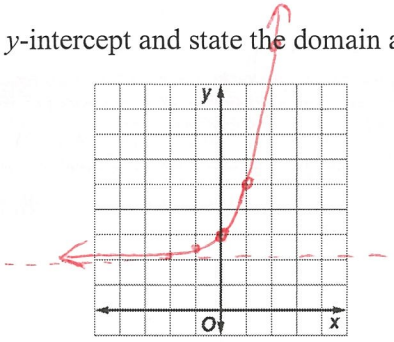
y-intercept: (0, 1)

Domain: All Real

Range: $y > 0$

17. Graph $y = 3^x + 2$. Find the y-intercept and state the domain and range.

x	y
-2	2 1/9
-1	2 1/3
0	3
1	5
2	11



17.

y-intercept: (0, 3)

Domain: All Real

Range: $y > 2$

18. An oil painting originally cost \$2500 and increases in value at a rate of 6% per year. Find the value of the painting after 12 years.

$y = a(1+r)^t \Rightarrow y = 2500(1+.06)^{12}$

18. \$5,030.49

19. A new car valued at \$16,500 *depreciates* at a steady rate of 12% per year. What is the value of the car in 10 years?

$y = a(1-r)^t \Rightarrow y = 16500(1-.12)^{10}$

19. \$4,595.27

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20. A chess tournament starts with 16 people competing. The exponential function $y = 16\left(\frac{1}{2}\right)^x$ describes how many people are remaining in the tournament after x rounds. How many people are left in the tournament after 2 rounds?

$16\left(\frac{1}{2}\right)^2 = 16\left(\frac{1}{4}\right) =$ 4 people

21. Simplify $y^9 \cdot y^{-3}$.

y^6

22. Simplify $(b^{-4})^3$.

$b^{-12} = \frac{1}{b^{12}}$

23. Simplify $\frac{a^{17}}{a^4}$.

a^{13}

24. A rectangle has a length of $25x^3$ and a width of $5x^2$. Find the area in square units.

$(25x^3)(5x^2) = 125x^5$ square units

25. Evaluate $(32)^{\frac{4}{5}}$.

$(32^{1/5})^4 = (2)^4 = 16$

26. Determine the amount of an investment if \$1800 is invested at an interest rate of 8% compounded quarterly for 12 years.

$A = P\left(1 + \frac{r}{n}\right)^{nt}$

$A = 1800\left(1 + \frac{.08}{4}\right)^{4 \cdot 12}$

$= 1800\left(1 + \frac{.08}{4}\right)^{48} =$ \$4656.73