Name _____ Date: _____ Class: _____

Algebra 2 with Support

Exponential Functions REVIEW: Simplifying and Solving Exponential Expressions

Spring 2017

Multiple Choice. Choose the best answer.

C 1. Which operation is used to simplify exponents that are a **power to a power**?

A. addition B. subtraction C. multiplication D. division

B 2. Which operation is used to simplify exponents through **division** of same bases?

A. addition B. subtraction C. multiplication D. division

A 3. Which operation is used to simplify exponents through **multiplication** of same bases?

A. addition B. subtraction C. multiplication D. division

C 5. Which is equivalent to $\frac{(x^4)^{-3}}{x^{-4}}$? $\rightarrow \frac{x^{-12}}{x^{-4}} \rightarrow \frac{x^4}{x^{12}} \rightarrow \frac{1}{x^8}$

A. x^2 B. $\frac{1}{x^2}$ C. $\frac{1}{x^8}$ D. x^{10}

D 6. Simplify the following completely: $(2x^2)^5 \cdot (2x^{-2})^3$ $2^5 x^{10} \cdot 2^3 x^{-6}$ $32x^{10} \cdot 8x^{-6} \rightarrow 256x^4$

A. $4x^{16}$ B. $4x^4$ C. $256x^{16}$ D. $256x^4$

B 7. Simplify the following expression: $2xy^2 \cdot 3x^3$ $6x^4y^2$

A. $2x^4y$ B. $6x^4y^2$ C. $6x^2y^2$ D. $6xy$

A 8. What is a possible base that both $\frac{1}{25}$ *and* 125^{-1} share? $\frac{1}{25}$ is same as 5^{-2} 125^{-1} is same as $(5^3)^{-1}$

A. 5 B. 3 C. 2 D. 6

C 9. Solve. $6^{-x} = 36$ $6^{-x} = 6^2 \rightarrow -x = 2$ $\therefore x = -2$

A. $x = 2$ B. $x = 3$ C. $x = -2$ D. $x = -3$

Simplify the following expressions.

10. $(7y^3)^2$ $49y^6$

11. $(3x)^2 \cdot (5x^3 \cdot x)^3$ $1125x^{14}$

$9x^2 \cdot 125x^9 \cdot x^3$

12. $\frac{x^5 \cdot y^{-7}}{x^3}$ $\frac{x^2}{y^7}$

13. $(x^3 \cdot x^5)^2$ x^{16}

$(x^8)^2$

Solve the simple ~~exponential equations~~ by using the Property of Equality.

14. $5^{x-5} = 5^{3x+3}$ $x = -4$

bases are already the same

$\therefore x - 5 = 3x + 3$

$-5 = 2x + 3$

$-8 = 2x \rightarrow x = -4$

15. $6^x = 1296$ $x = 4$

$6^x = 6^4$

$x = 4$

16. $16^{3x} = 64^4$ $x = 2$

$(4^2)^{3x} = (4^3)^4$

$4^{6x} = 4^{12}$

$6x = 12$

$x = 2$

17. $(\frac{1}{3})^x = 9^{-x-3}$ $x = -6$

$(3^{-1})^x = (3^2)^{-x-3}$

$-x = -2x - 6$

$x = -6$

18. $7^{4x-8} = 1$ $x = 2$

$7^{4x-8} = 7^0$

$4x - 8 = 0$

$4x = 8$

$x = 2$

19. $5^{3x+1} = (\frac{1}{25})^x$ $x = -\frac{1}{5}$

$5^{3x+1} = (5^{-2})^x$

$3x + 1 = -2x \rightarrow x = -\frac{1}{5}$

$-5x = 1$

20. $81 = 3 \cdot 9^{x-1}$ $x = \frac{5}{2}$

$3^4 = 3^1 \cdot (3^2)^{x-1}$ ↑ distribute

$3^4 = 3^1 \cdot 3^{2x-2}$ Add the exponents

$3^4 = 3^{2x-1} \rightarrow 4 = 2x - 1$

$5 = 2x \rightarrow x = \frac{5}{2}$

21. $4 = 2^{x+3}$ $x = -1$

$2^2 = 2^{x+3}$

$2 = x + 3$

$-1 = x$

22. $3^{-6x} \cdot 3^{4+9x} = 3^9$ $x = \frac{5}{3}$

ADD!

$3^{4+3x} = 3^9$

$4 + 3x = 9$

$3x = 5$

25. $16 \cdot 2^{4x+1} = 2^{-8x}$ $x = -\frac{5}{12}$

$2^4 \cdot 2^{4x+1} = 2^{-8x}$

Add the exponents

$2^{4x+5} = 2^{-8x}$

$4x + 5 = -8x$

$5 = -12x$

$x = -\frac{5}{12}$

26. $16^{x+2} = 64^{3x-1}$ $x = 1$

$(4^2)^{x+2} = (4^3)^{3x-1}$

DISTRIBUTE!

$2x + 4 = 9x - 3$

$4 = 7x - 3$

$7 = 7x \rightarrow x = 1$

27. $5^{3x-7} = 1$ $x = \frac{7}{3}$

$5^{3x-7} = 5^0$

$3x - 7 = 0$

$3x = 7$

$x = \frac{7}{3}$