Name ______________________ Block __________ Date __________

Chapter 7 Test Review

Algebra 1 Quadratic Emphasis

Simplify each expression. Use positive exponents.

1. $a^4b^{-7}c^0$ $\frac{a^4}{b^7}$

2. $(2u)^5 \bullet (4u^3v^6)^3$ $2048u^{14}v^{18}$

3. $\frac{p^3q^2}{q^5r^6}$ $\frac{p^3}{q^3r^6}$

4. $(m^3n^{-5}m^{-1})^{-3}$ $\frac{n^{15}}{m^6}$

5. $\left(\frac{x^4y^{-2}}{x^{-3}y^5}\right)^{-1}$ $\frac{y^7}{x^7}$

6. $u^{-5}v^2(-u^3v^{-2})^4$ $\frac{u^7}{v^6}$

7. If $z = 3$, which expression has the greatest value?

A. $z^{-6}z^4$ $\frac{1}{z^2}$ $\frac{1}{9}$

B. $(z^{-2}z^5)^{-2}$ $\frac{1}{z^6}$ $\frac{1}{729}$

C. $(z^3)^5$ z^{15} 14348907

D. $-(z^2z^{-4})^{-3}$ $-z^6$ -729

Simplify each expression. Use positive exponents.

8. $(cd)^{\frac{2}{3}}\left(a^{\frac{1}{4}}d\right)^3$ $a^{\frac{3}{4}}c^{\frac{2}{3}}d^{\frac{11}{3}}$

9. $\frac{(2x)^4}{6x^4}$ $\frac{16x^4}{6x^4} = \frac{8}{3}$

10. $(2x)^3\,(10x)^2$ $800x^5$

11. $\left(a^2b\right)^{-4}\,(b^2c)^{-3}$ $\frac{1}{a^8b^{10}c^3}$

12. A company that manufactures graphics cards for computers uses the formula $c = 300\sqrt[3]{n^2}$ to determine the cost c, in dollars, of producing n cards. How much will it cost to produce 1000 graphics cards? $30,000

13. A red blood cell is 7×10^{-6} m in diameter. There are about 2×10^{-13} red blood cells in a 125-lb person. If all of the red blood cells were lined up end to end, how long would the line be? Write your answer in scientific notation.

$(7\times10^{-6})(2\times10^{-13})$
14×10^{-19}
1.4×10^{-18}

Evaluate each function for $x = -1, 1, 2$.

14. $f(x) = 4 \bullet 7^x$

$f(-1) = \frac{4}{7}$
$f(1) = 28$
$f(2) = 196$

15. $y = \frac{2}{3} \bullet 6x$

$f(-1) = -4$
$f(1) = 4$
$f(2) = 8$

16. $f(x) = 13 \bullet (1.3)^x$

$f(-1) = 10$
$f(1) = 16.9$
$f(2) = 21.97$

17. $h(x) = 3 \bullet \left(\frac{4}{5}\right)^x$

$f(-1) = \frac{15}{4}$ or 3.75
$f(1) = \frac{12}{5}$ or 2.4
$f(2) = \frac{48}{25}$ or 1.92

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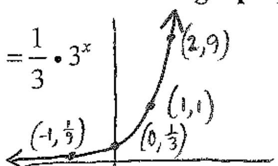
Chapter 7 Test Review

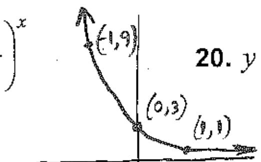
Algebra 1 Quadratic Emphasis

Graph each function on graph paper.

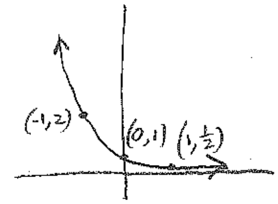
18. $f(x)=\frac{1}{3}\cdot 3^x$



19. $y=3\cdot\left(\frac{1}{3}\right)^x$



20. $y=1\cdot 0.5^x$



21. A population of 2000 fish increases at an annual rate of 7.5%.

a. How many fish will there be in 10 years?

b. Write a function f(x) to represent the equivalent yearly increase in population.

$y=2000(1.075)^x$

$y=2000(1.075)^{10}$

$y\approx 4122$

22. Suppose you deposit \$1000 in a savings account that pays 4.8% interest compounded yearly.

a. Write an exponential function to model the amount of money in your savings account.

b. How much will you have in your account after 3 years? After 7 years?

NOT DOING COMPOUND INTEREST ON CH. 7 TEST

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

$A=1000\left(1+\frac{.048}{1}\right)^{1\cdot t}$

$A=1000(1+.048)^{1\cdot 3}$

$A=\$1151.02$

$A=\$1388.45$

23. The function $y=41\cdot 0.95^x$ models the difference (in minutes) between men's and women's finishing times for the Boston Marathon. The number of years since women first officially ran the race in 1972 is represented by x.

a. Does the exponential function represent *growth* or *decay*?

b. Estimate the difference between finishing times in 1990.

c. Predict the difference between finishing times in 2015.

1990 − 1972, x = 18

$y=41(.95)^{18}$

$y=16.3$ minutes

2015 − 1972, x = 43

$y=41(.95)^{43}$

$y=4.5$ minutes

Write each expression in exponential form.

24. $\sqrt[7]{(xyz)^3}$ $(xyz)^{\frac{3}{7}}$ or $x^{\frac{3}{7}}y^{\frac{3}{7}}z^{\frac{3}{7}}$

25. $\sqrt[3]{27x^5}$ $3\sqrt[3]{x^5}$ $3x^{\frac{5}{3}}$

26. $\sqrt[2]{25x^3}$ $5\sqrt[2]{x^3}$ $5x^{\frac{3}{2}}$

Write an explicit formula to represent the geometric sequence.

$A_n=A_1\cdot r^{n-1}$

27. 3,9,27,81...

$r=\frac{9}{3}=3$

$A_n=3\cdot 3^{n-1}$

28. 2,4,8,16,32,64,...

$r=\frac{4}{2}=2$

$A_n=2\cdot 2^{n-1}$

29. 300,150,75,37.5,...

$r=\frac{150}{300}=\frac{1}{2}$

$A_n=300\cdot\left(\frac{1}{2}\right)^{n-1}$