

Honors Algebra 1
Q3 Midterm Study Guide
Ch. 8

Name: key
Period:

CHAPTER 8

(1-8) Simplify. Leave no negative exponents.

1. $\frac{t^2}{t^{-3}} = t^{2-(-3)} = t^5$

2. $\frac{10^0}{x^2 y^{-5}} = \frac{1}{x^2 y^{-5}} = \frac{y^5}{x^2}$

3. $\frac{s^{11} r^3}{s^{13} r^3} = \frac{t^3 - t^3}{s^2} = \frac{t^0}{s^2} = \frac{1}{s^2}$

4. $\left(\frac{x^2}{y^{-4}}\right)^{-2} \left(\frac{x^{-2}}{y^3}\right) = \left(\frac{x^2 y^4}{1}\right)^{-2} \left(\frac{1}{x^2 y^3}\right) = \left(\frac{1}{x^2 y^4}\right)^2 \left(\frac{1}{x^2 y^3}\right) = \frac{1}{x^4 y^8} \cdot \frac{1}{x^2 y^3} = \frac{1}{x^6 y^{11}}$

5. $(4x)(3x^5 y^7)(-4xy^{-3}) = (12x^6 y^7)(-4xy^{-3}) = -48x^7 y^4$

6. $\frac{7x^4 y z^{-7}}{21x^{-4} y^6 z^{-2}} = \frac{1x^8}{3y^5 z^5} = \frac{x^8}{3y^5 z^5}$

7. $(3x^{-4} y^6 z^3)^{-5} = \frac{1}{(3x^{-4} y^6 z^3)^5} = \frac{1}{243x^{-20} y^{30} z^{15}} = \frac{x^{20}}{243y^{30} z^{15}}$

8. $\left(\frac{9m^2 n^{-3}}{6mn}\right)^3 = \left(\frac{3m}{2n^4}\right)^3 = \frac{27m^3}{8n^{12}}$

(9-11) Explain if the following is linear or exponential. Then, write the equation.

9.

X	-2	-1	0	1	2	3
Y	3	5	7	9	11	13

+2 +2 +2 +2 +2

$y = 2x + 7$

10.

x	-2	-1	0	1	2	3
y	1	2	4	8	16	32

x2 x2 x2 x2 x2

$y = 4 \cdot 2^x$

11.

X	-2	-1	0	1	2
Y	12.5	10	8	6.4	5.12

.8 .8 .8 .8

$y = 8 \cdot 0.8^x$

12.

x	-2	-1	0	1	2	3
y	7	3	-1	-5	-9	-13

-4 -4 -4 -4 -4

$y = -4x - 1$

(13-15) Explain if the following exponential model is growth or decay.

13. $y = 16(1.20)^x$ $1.20 > 1$
growth

14. $y = 12(.80)^x$ $0.80 < 1$
decay

15. $y = \frac{1}{3} \cdot \left(\frac{7}{2}\right)^{-x} = \frac{1}{3} \cdot \left(\frac{2}{7}\right)^x$ $\frac{2}{7} < 1$
decay

16. Find the product in scientific notation: $(2.5 \times 10^{-6})(5.4 \times 10^2)$
 13.5×10^{-4}
 1.35×10^{-3}

17. Write 52,345 in scientific notation.
 5.2345×10^4

(18-19) Answer the following exponential growth/decay problems. $y = a(1 \pm r)^x$

18. You deposit \$5,000 in an account that pays 5.7% interest compounded yearly. What will the account balance for the given number of years? (Round to the nearest penny)

a) 3 years

$$y = 5000(1 + 0.057)^3$$

$$= \boxed{\$5904.66}$$

b) 7 years

$$y = 5000(1 + 0.057)^7$$

$$= \boxed{\$7370.47}$$

c) 18 months ≈ 1.5 years

$$y = 5000(1 + 0.057)^{1.5}$$

$$= \boxed{\$5433.54}$$

19. The population of Lakeview High School has been decreasing by about 5% each year. In 2005 there were about 3,500 people at Lakeview. What will be Lakeview High School's population in..... (Round to the nearest person)

a) 3 years

$$y = 3500(1 - 0.05)^3$$

$$= \boxed{3001 \text{ students}}$$

b) 7 years

$$y = 3500(1 - 0.05)^7$$

$$= \boxed{2444 \text{ students}}$$

c) 12 years

$$y = 3500(1 - 0.05)^{12}$$

$$= \boxed{1891 \text{ students}}$$

20. Are the following two equations equivalent: $y = \frac{1}{2}(2)^{x-3}$ and $y = 0.0625(2)^x$? Hint: use the properties of exponents to prove or disprove. Then graph the function listed below.

$$y = \frac{1}{2} \left(\frac{2^x}{2^3} \right)$$

$$y = \frac{1}{2} \left(\frac{2^x}{8} \right)$$

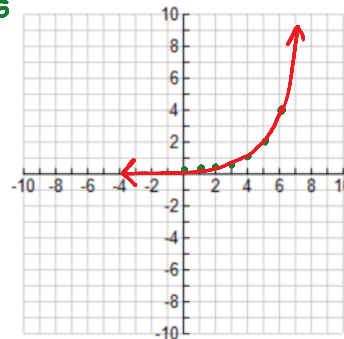
$$y = \frac{1 \cdot 2^x}{16}$$

$$y = \frac{1}{16} \cdot 2^x \Rightarrow \boxed{y = 0.0625 \cdot 2^x}$$

YES!

x	y
0	0.0625
1	0.125
2	0.25
3	0.5
4	1
5	2
6	4

Graph $y = 0.0625(2)^x$



21. Complete the table for the function $y = 3^x$. Then, sketch the graph.

X	-2	-1	0	1	2
Y	1/9	1/3	1	3	9

