

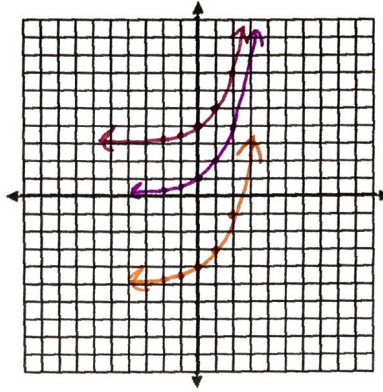
## Spring Break Review

1. Graph the exponential functions  $y = 2^x$ ,  $y = 2^x + 3$ , and  $y = 2^x - 5$  on the same set of axes. In complete sentences, compare and contrast the graphs. LABEL EACH

x	y
-2	$\frac{1}{4}$
-1	$\frac{1}{2}$
0	1
1	2
2	4

x	y
-2	$3\frac{1}{4}$
-1	$3\frac{1}{2}$
0	4
1	5
2	7

x	y
-2	$-4\frac{3}{4}$
-1	$-4\frac{1}{2}$
0	-4
1	-3
2	-1



2. Between 1990 and 2000, the population of Michigan had an annual growth rate of about 6.9%. If the state's population was 9,938,444 in 2000, approximately what was Michigan's population in 1990?

$$9938444 = a(1.069)^{10}$$

~~$$a \approx 5,099,661$$~~

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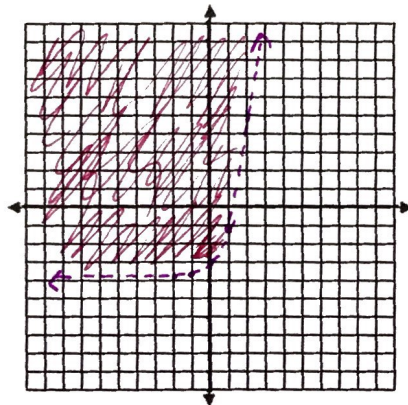
3. Determine the amount of money in a savings account providing an annual rate of 3.2% compounded monthly if Sandra made a one-time deposit of \$6500 in to the account and left it there for 5 years.

$$A = 6500 \left(1 + \frac{.032}{12}\right)^{12 \cdot 5}$$

$$A \approx \$7626.20$$

4. Graph  $y > 3^x - 4$ .

x	y
-2	$-3\frac{8}{9}$
-1	$-3\frac{2}{3}$
0	-3
1	-1
2	5



5. Jared purchases a new car for \$24,600. The car loses 19.5% of its value each year.

a. Write a function to model the VALUE of the car.

$$y = 24600(1 - .195)^x$$

b. Find the value of the car after 6 months of ownership

$$y = 24600(1 - .195)^{1/2}$$

$$y \approx \$22071.56$$

c. Find the value of the car after four years of ownership.

$$y = 24600(1 - .195)^4$$

$$y \approx \$10330.44$$

6. Compare the balance after 12 years of a \$32,000 investment earning 5% interest compounded continuously to the same investment compounded quarterly.

$$A = 32000e^{.05 \cdot 12}$$

$$A \approx \$58,307.80$$

$$A = 32000\left(1 + \frac{.05}{4}\right)^{4 \cdot 12}$$

$$A \approx \$58,091.36$$

Compounded continuously will earn you \$216.44 more.

7. Write each equation in exponential form.

a.  $\log_{243} 27 = \frac{3}{5}$

$$243^{3/5} = 27$$

b.  $\log_{16} 2 = \frac{1}{4}$

$$16^{1/4} = 2$$

8. Write each equation in logarithmic form.

a.  $7^5 = 16807$

$$\log_7 16807 = 5$$

b.  $3^{-3} = \frac{1}{27}$

$$\log_3 \frac{1}{27} = -3$$

9. Evaluate the expression  $\log_3 6561 = x$

$$3^x = 6561$$

$$3^x = 3^8$$

$$x = 8$$

or

$$\frac{\log 6561}{\log 3} = 8$$

10. Given that  $\log 4 = 0.6021$ , evaluate the logarithm:  $\log 400$

$$\log 4 + \log 100$$

$$.6021 + 2$$

$$\boxed{2.6021}$$

11. Evaluate each expression.

a.  $\log 5(2)^8$

$$\log 1280$$

$$\approx \boxed{3.1072}$$

b.  $\log \frac{12^2}{4}$

$$\log 36$$

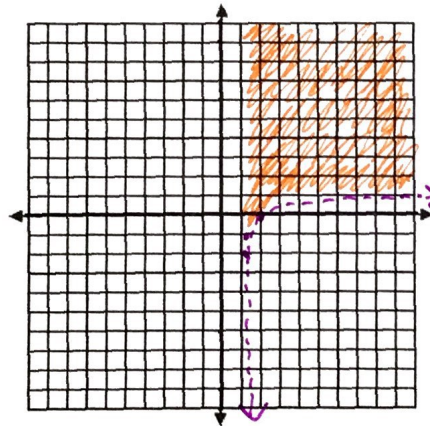
$$\approx \boxed{1.5563}$$

12. Graph  $y > \log(x-1)$ .

$$10^y = x - 1$$

$$10^y + 1 = x$$

x	y
$\frac{1}{100} + 1$	-2
$\frac{1}{10} + 1$	-1
2	0
11	1
101	2



13. Find the value of  $\log_4 365$  using the change of base formula.

$$\frac{\log 365}{\log 4} \approx \boxed{4.2559}$$