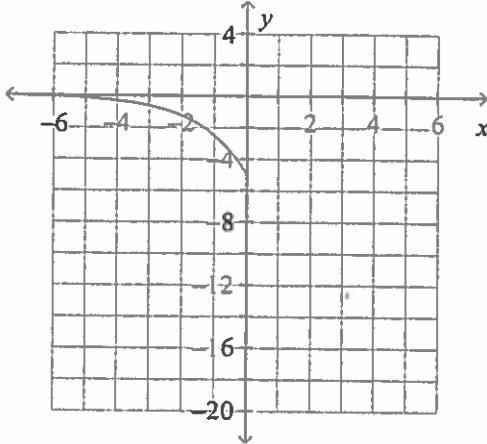


Chapter 8 Exam Review

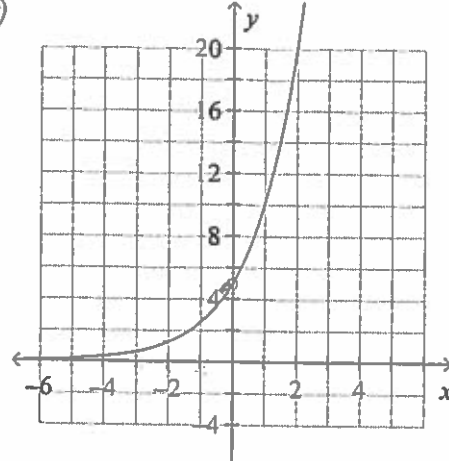
Multiple Choice

- C 1 Graph the exponential function. $y = 5(2)^x$

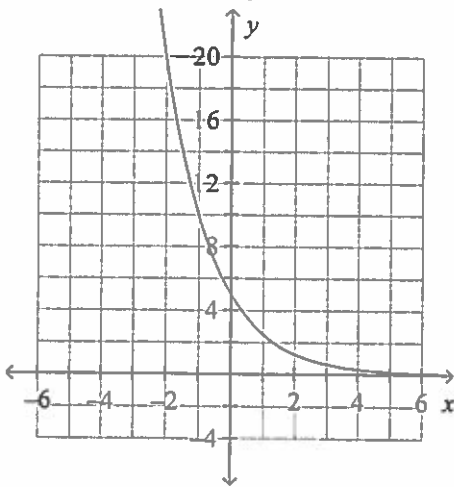
a)



c)



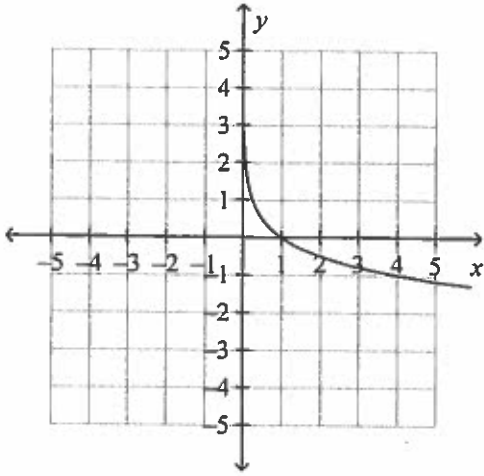
b)



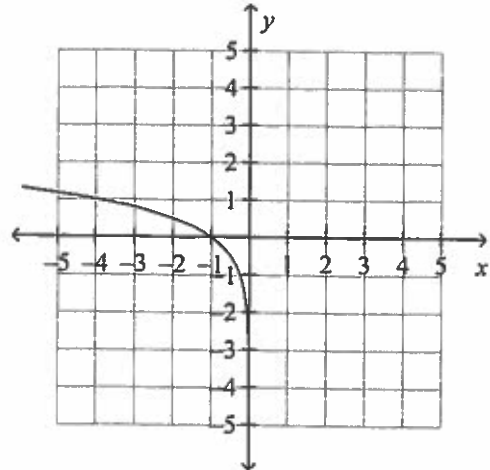
x	$5(2)^x$	
-3	$5(2)^{-3} = 5 \cdot \frac{1}{8}$	$5/8 = 0.625$
-2	$5(2)^{-2} = 5 \cdot \frac{1}{4}$	$5/4 = 1.25$
-1	$5(2)^{-1} = 5 \cdot \frac{1}{2}$	$5/2 = 2.5$
0	$5(2)^0 = 5 \cdot 1$	5
1	$5(2)^1 = 5 \cdot 2$	10
2	$5(2)^2 = 5 \cdot 4$	20
3	$5(2)^3 = 5 \cdot 8$	40

2 Graph the logarithmic equation. $y = \log_4 x$. Use $y = \{-2, -1, 0, 1, 2\}$.

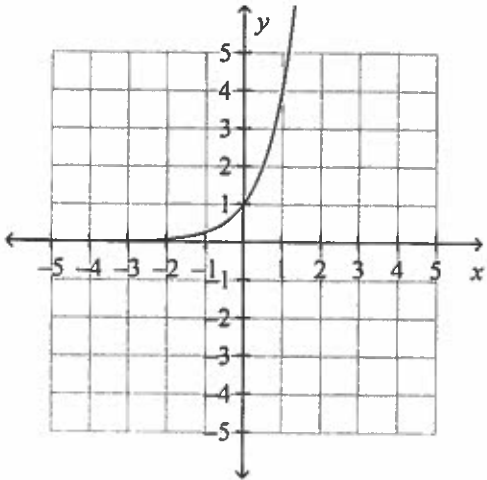
a)



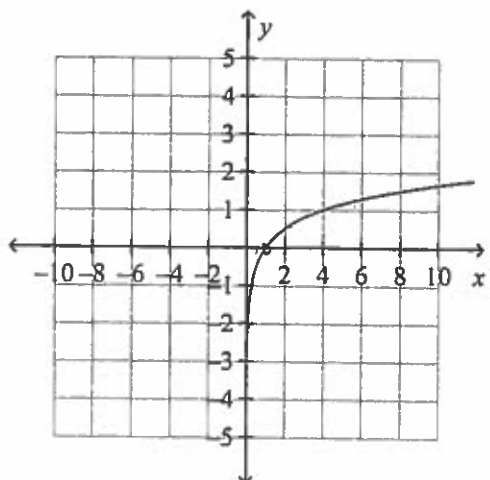
c)



b)



d)



x	y
4^{-2}	$1/16$
4^{-1}	$1/4$
4^0	1
4^1	4
4^2	16

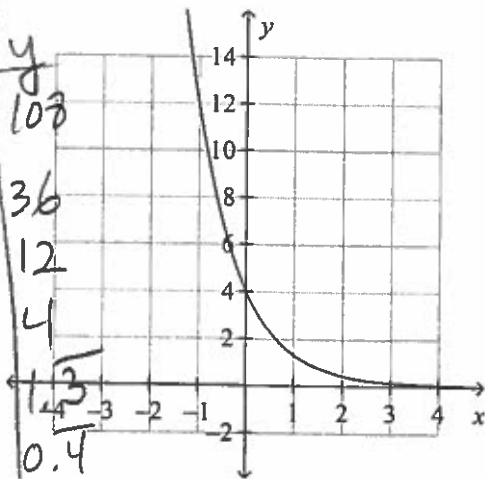
$y = \log_4 x$

$4^y = x$

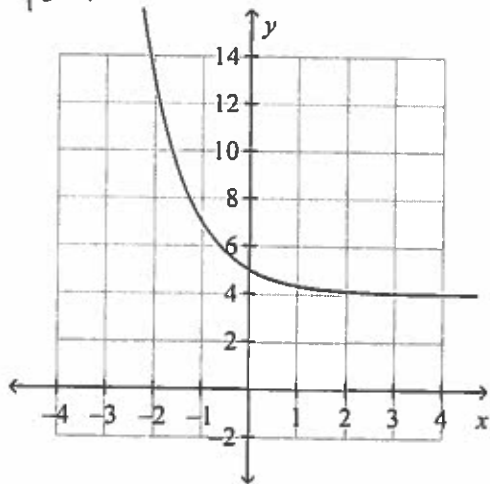
3 Graph the function.

$$y = 4\left(\frac{1}{3}\right)^x$$

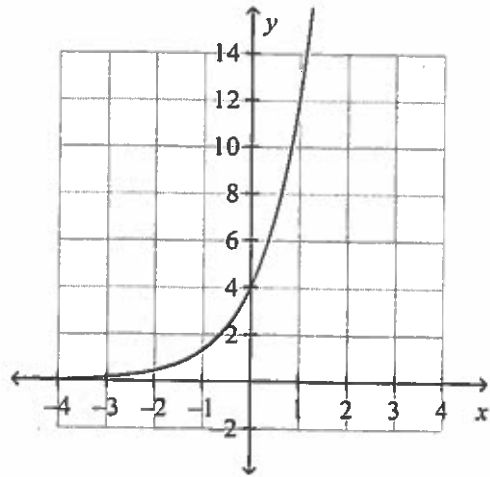
x	$4\left(\frac{1}{3}\right)^x$	y
-3	$4\left(\frac{1}{3}\right)^{-3}$	108
-2	$4\left(\frac{1}{3}\right)^{-2}$	36
-1		12
0		4
1		$\frac{4}{3}$
2		0.4
3		0.15



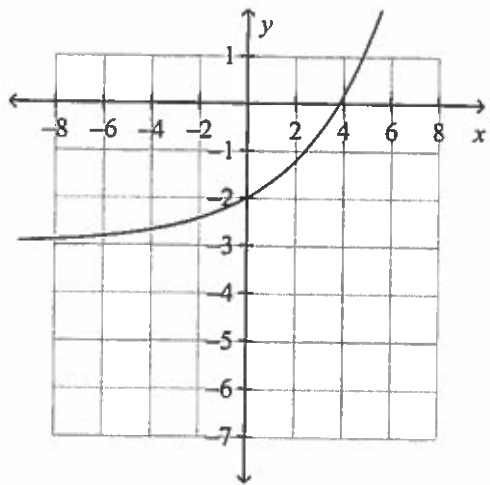
b)



c)



d)



Short Answer

4 Write the equation in logarithmic form.

$$5^3 = 125 \quad \log_5 125 = 3$$

5 Evaluate $e^{1.1}$ to four decimal places.

$$3.0042$$

6 Expand the logarithmic expression.

$$\log_4 5m^5$$

$$\log_4 5 + \log_4 m^5$$

$$\log_4 5 + 5 \log_4 m$$

$$\log_b MN = \log_b M + \log_b N$$

$$\log_b M^x = x \log_b M$$

- 7 Evaluate the logarithm.

$$\log_4 \frac{1}{1024} = x$$

$$4^x = 4^{-5}$$

$$x = -5$$

$$4^x = \left(\frac{1}{1024}\right)$$

$$\log 4^x = \log\left(\frac{1}{1024}\right)$$

$$\frac{x \log 4}{\log 4} = \frac{\log\left(\frac{1}{1024}\right)}{\log(4)}$$

$$x = -5$$

- 8 Evaluate the logarithm.

$$\log_3 2187 = x$$

$$3^x = 2187$$

$$x \frac{\log 3}{\log 3} = \frac{\log 2187}{\log 3}$$

$$x = 7$$

$$\log_b M^x = x \log_b M$$

- 9 Solve $9^{2x} = 105$

$$\log 9^{2x} = \log 105$$

$$\frac{2x \log 9}{\log 9} = \frac{\log(105)}{\log(9)}$$

$$2x = 2.1181$$

$$x = 1.059$$

- 10 Solve $5^{6x} = 89$. Round to the nearest ten-thousandth.

$$\frac{6x \log 5}{\log 5} = \frac{\log 89}{\log 5}$$

$$6x = 2.7389$$

$$x = 0.4648$$

- 11 An initial population of 250 quail increases at an annual rate of 28%. Write an exponential function to model the quail population.

$$A = 250$$

$$r = +0.28$$

$$t = \text{time}$$

$$y = A(1 \pm r)^t$$

$$y = 250(1.28)^t$$

- 12 Write the equation $\log_{32} 8 = \frac{3}{5}$ in exponential form.

$$32^{\frac{3}{5}} = 8$$

$$\log_b \frac{M}{N} = \log_b M - \log_b N$$

- 13 Write the expression as a single logarithm.

$$\log_4 18 - \log_4 3$$

$$\log_4 \frac{18}{3}$$

$$\log_4 6$$

- 14 Suppose you invest \$100 at an annual interest rate of 5.5% compounded continuously. How much will you have in the account after 10 years?

$$y = A_0 e^{rt}$$

$$A_0 = 100$$

$$r = 0.055$$

$$t = 10$$

$$y = 100 e^{(0.055)(10)}$$

$$= 100 e^{0.55}$$

$$y = \$173.33$$

- 15 Solve $\log_4 x = 2$:

$$10^2 = 4^x$$

$$100 = 4^x$$

$$x = 25$$

- 16 Determine whether the function $y = 9(14.7)^x$ represents exponential growth or exponential decay.

a. Exponential Growth

b. Exponential Decay

- 17 Determine whether the function $y = 11\left(\frac{2}{17}\right)^x$ represents exponential growth or exponential decay.

a. Exponential Growth

b. Exponential Decay