

Section 6.1-6.3 Enrichment

What can travel around the world while staying in a corner?

1. Which function g represents the exponential function $f(x) = 3^x$ after a vertical stretch of 4 and a reflection across the x -axis?

I $g(x) = 4(3)^x$ A $g(x) = -4(3)^x$

M $g(x) = (3)^{4x}$ G $g(x) = (3)^{-4x}$

2. The function $f(x) = 400(1.2)^x$ models a population of mice after x years. What will the population be in 7 years?

M about 800 S about 1400

C about 200 D about 600

3. For the function $f(x) = 2 \cdot (3)^x$, identify the y -intercept and asymptote.

A y -intercept 2 and Asymptote $y=3$ J y -intercept 3 and Asymptote $y=2$

T y -intercept 2 and Asymptote $y=0$ K y -intercept 3 and Asymptote $y=0$

4. The graph of an exponential model in the form $y = a \cdot b^x$ passes through the points (2, 3) and (3, 9). Which point is also on the graph?

E (1, -3) A (1, 1)

O (4, 15) U (4, 16)

5. A school of fish has a population of 200. The population is decreasing at a rate of 5% per year. What is the population after 5 years? Round your answer to the nearest whole number

P 100 N 255

K 6 M 155

6. What is the solution to the equation $\log_3(2x - 3) = -1$? Round to the nearest tenth.

P 1.7 B 0

C 1.3 D -1.3

1

2

3

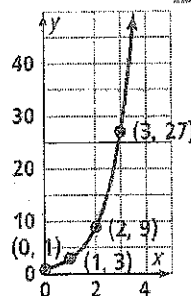
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5

6

1. The graph shows the function $f(x) = 3^x$. What is the value of $f^{-1}(x)$, at $x = 3$?

- A 0
- B 1
- C 3
- D 27



2. The logarithmic function $f(x) = \log x$ is transformed to $g(x) = \log(x + 1) + 3$. Which of the following is true?

- A $f(x)$ is translated 1 unit upward.
- B $f(x)$ is translated 3 units downward.
- C The vertical asymptote shifts 1 unit to the left.
- D The vertical asymptote shifts 3 units to the right.

Find the inverse of each function

3. $f(x) = \log_2(9x)$

4. $j(x) = 5^{x+3}$

5. $h(x) = \log(4x)$

6. Find and correct the error a student made when finding the inverse of the logarithmic function $f(x) = \log_6(4x + 2) - 5$.

$y = \log_6(4x + 2) - 5$ Write in $y = f(x)$ form.

$x = \log_6(4y + 2) - 5$ Interchange x and y .

$x + 5 = \log_6(4y + 2)$ Add 5 on each side.

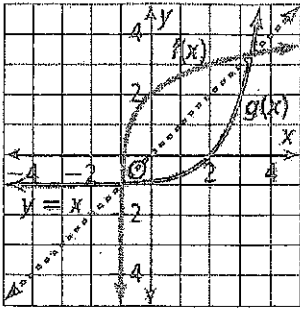
$6^x + 5 = 4y + 2$ Rewrite in exponent form.

$6^x + 3 = 4y$ Subtract 2 from each side.

$\frac{6^x + 3}{4} = y$ Divide by 4 on each side.

The equation of the inverse of $f(x) = \log_6(4y + 2) - 5$ is $f^{-1}(x) = \frac{6^x + 3}{4}$.

7. The $f(x) = 3^{(x-2)} - 1$ and $g(x) = \log_3(x+1) + 2$ are inverse functions shown on the graph at the right. Complete the table without using a calculator.



$f(x) = 3^{(x-2)} - 1$		$g(x) = \log_3(x+1) + 2$	
x	y	x	y
0	$-\frac{8}{9}$	$-\frac{8}{9}$	0
1	$-\frac{2}{3}$		
		0	2
3	2		
		8	4
5	26		
Domain:		Domain:	
Range: $\{y \mid y > -1\}$		Range: All real numbers	
x-intercept: 2; y-intercept: $-\frac{8}{9}$		x-intercept: y-intercept:	
Asymptote:		Asymptote: $y = -1$	
End Behavior: As $x \rightarrow -\infty, y \rightarrow -1$ As $x \rightarrow \infty, y \rightarrow \infty$		End Behavior:	