

Class Name : **Lacoste College Algebra Fall 2019**

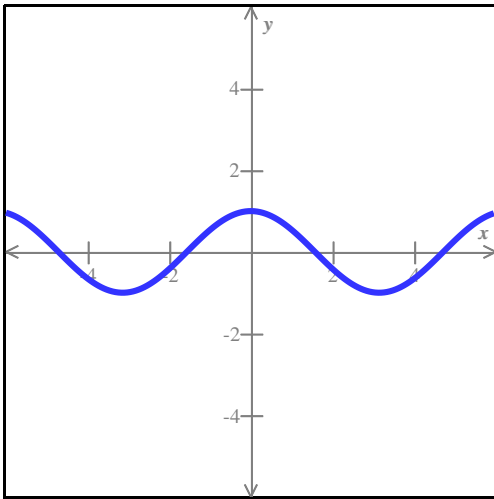
Instructor Name : **Master Templates**

Student Name : _____

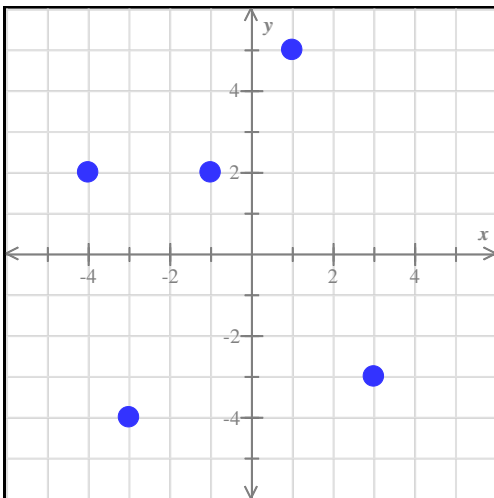
Instructor Note : **All practice problems for Exam 4. There are multiple versions so that you can try challenging problems more than once.**

Question 1 of 36

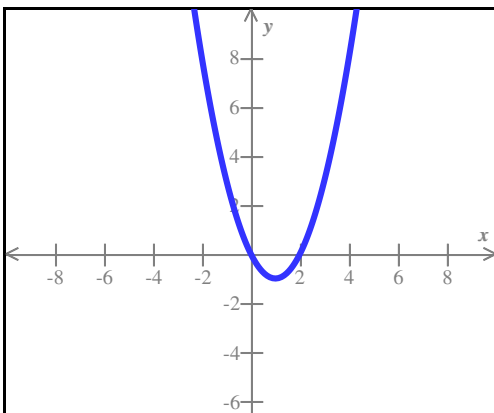
For each function graphed below, state whether it is one-to-one.



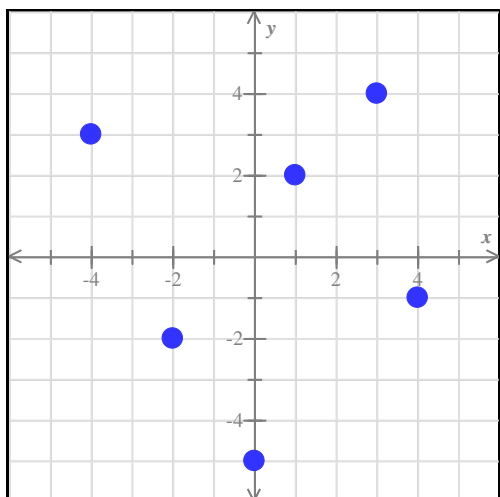
One-to-one?:
Yes No



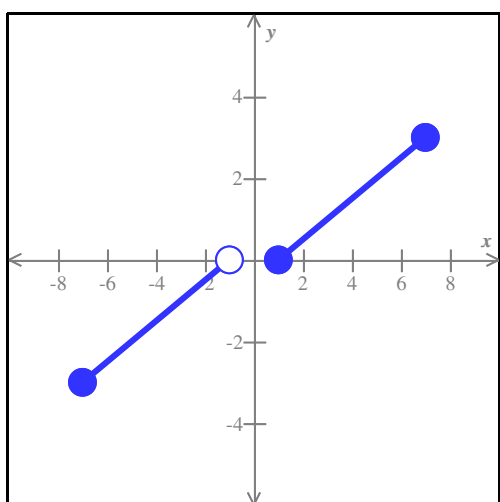
One-to-one?:
Yes No



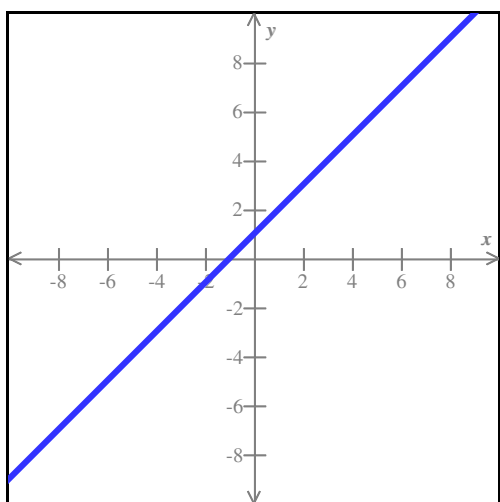
One-to-one?:
Yes No



One-to-one?:
Yes No



One-to-one?:
Yes No



One-to-one?:
Yes No

Question 2 of 36

For each pair of functions f and g below, find $f(g(x))$ and $g(f(x))$.
Then, determine whether f and g are inverses of each other.

Simplify your answers as much as possible.

(Assume that your expressions are defined for all x in the domain of the composition.

You do *not* have to indicate the domain.)

(a)	$f(x) = \frac{3}{x}$	(b)	$f(x) = -x + 4$
	$g(x) = \frac{3}{x}$		$g(x) = x + 4$
	$f(g(x)) =$		$f(g(x)) =$
	$g(f(x)) =$		$g(f(x)) =$
	- f and g are inverses of each other		- f and g are inverses of each other
	- f and g are <i>not</i> inverses of each other		- f and g are <i>not</i> inverses of each other

Question 3 of 36

The one-to-one functions g and h are defined as follows.

$$g = \{(-8, 4), (-1, 2), (2, -8), (4, 1)\}$$

$$h(x) = 3x + 2$$

Find the following.

$g^{-1}(4) =$	
$h^{-1}(x) =$	
$(h^{-1} \circ h)(-3) =$	

Question 4 of 36

Consider the function $f(x) = \sqrt{1-x} + 3$ for the domain $(-\infty, 1]$.

Find $f^{-1}(x)$, where f^{-1} is the inverse of f .

Also state the domain of f^{-1} in interval notation.

Question 5 of 36

The one-to-one function f is defined below.

$$f(x) = 1 - x^3$$

Find $f^{-1}(x)$, where f^{-1} is the inverse of f .

Question 6 of 36

The one-to-one function h is defined below.

$$h(x) = \frac{x}{7x - 5}$$

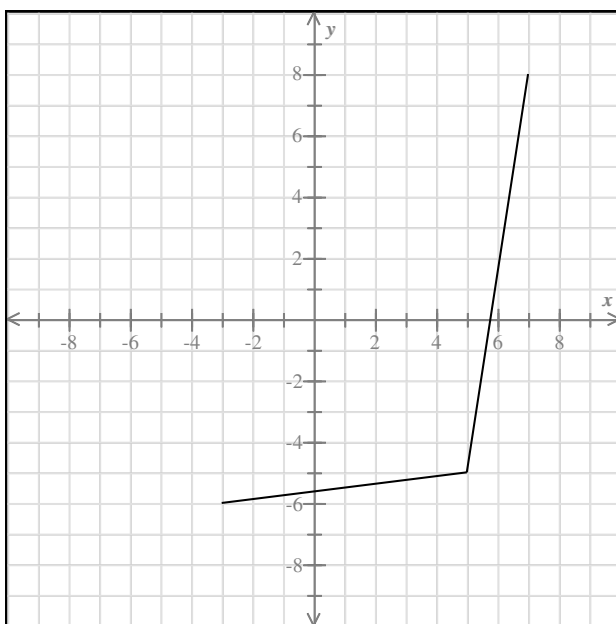
Find $h^{-1}(x)$, where h^{-1} is the inverse of h .

Also state the domain and range of h^{-1} in interval notation.

Question 7 of 36

Below is the entire graph of function f .

Graph f^{-1} , the inverse of f .



Question 8 of 36

The function f is defined by the following rule.

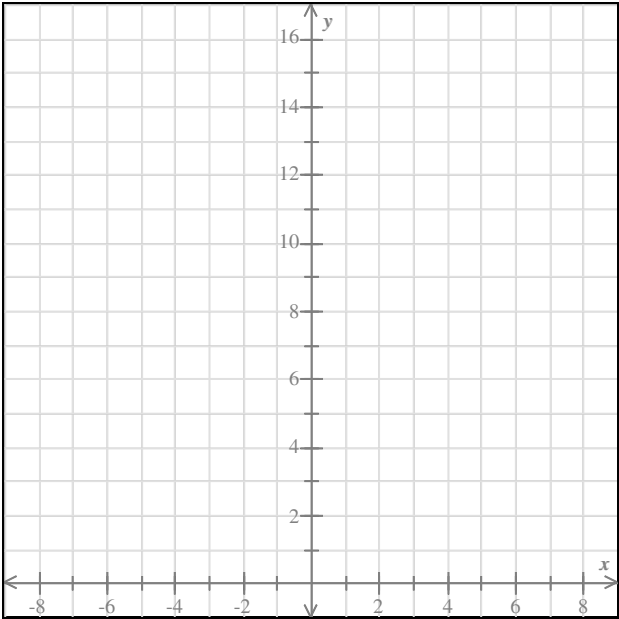
$$f(x) = 5^x$$

Find $f(x)$ for each x -value in the table.

x	$f(x)$
-2	<input type="text"/>
-1	<input type="text"/>
0	<input type="text"/>
1	<input type="text"/>
2	<input type="text"/>

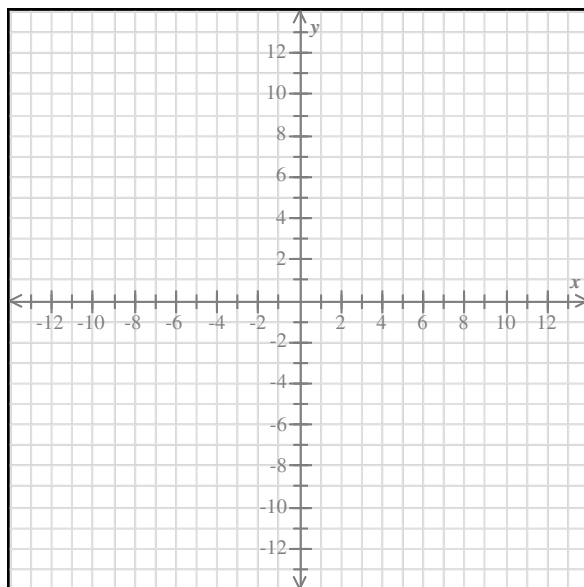
Question 9 of 36

Graph the exponential function $f(x) = \left(\frac{1}{4}\right)^x$.



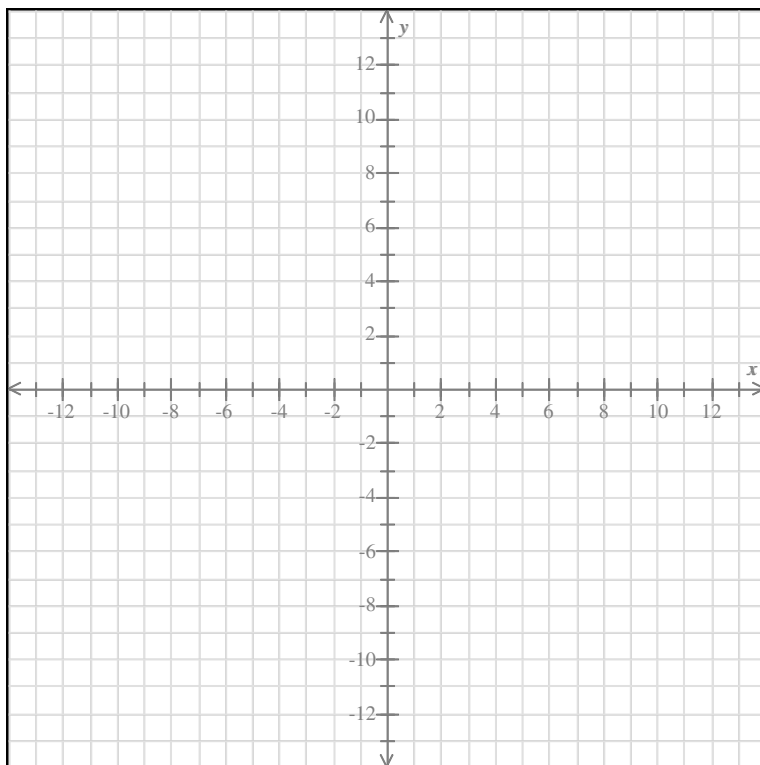
Question 10 of 36

Graph the exponential function $f(x) = \frac{5}{2}(2)^x$.



Question 11 of 36

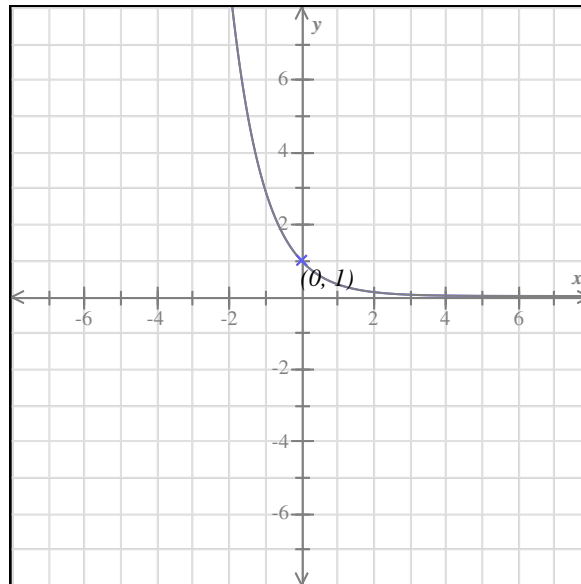
Graph the exponential function $f(x) = -\left(\frac{5}{8}\right)^{-x}$.



Question 12 of 36

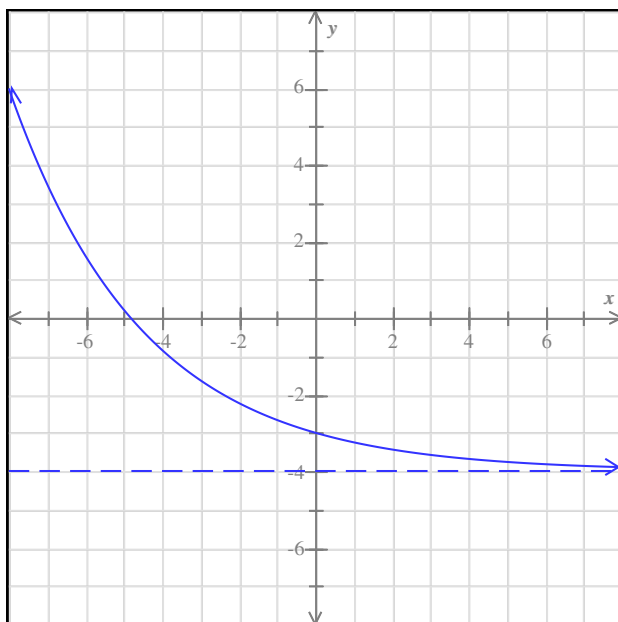
Below is the graph of $y = \left(\frac{1}{3}\right)^x$.

Translate it to become the graph of $y = \left(\frac{1}{3}\right)^{x+1} + 4$.



Question 13 of 36

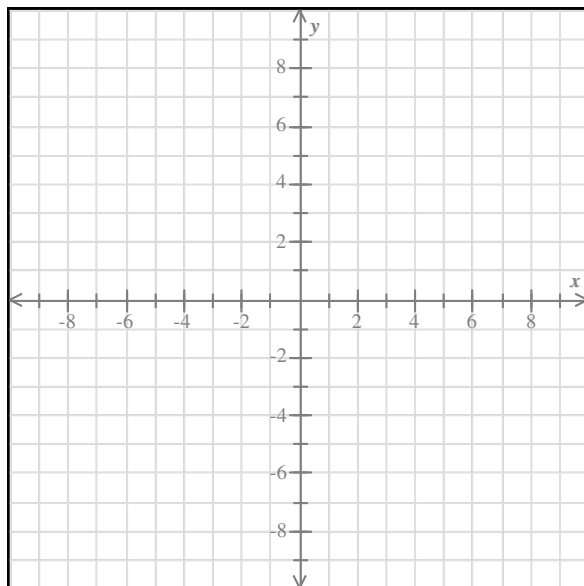
The graph of an exponential function is shown in the figure below.
The horizontal asymptote is shown as a dashed line.
Find the range and the domain.



Write your answers as inequalities, using x or y as appropriate.
Or, you may instead click on "Empty set" or "All reals" as the answer.

Question 14 of 36

Graph the function $g(x) = 3^{x+2}$ and give its domain and range using interval notation.

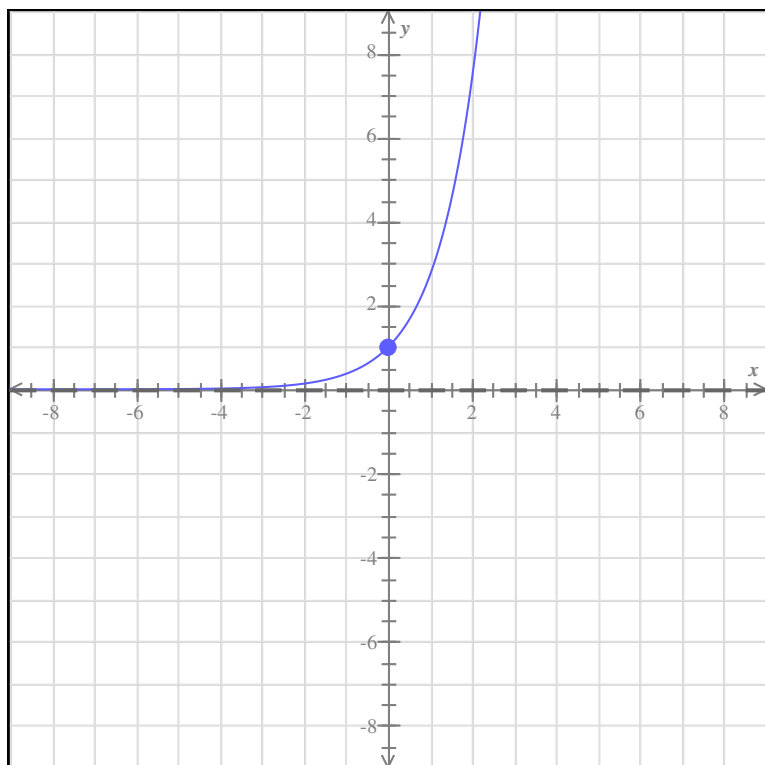


Question 15 of 36

Below is the graph of $y = e^x$.

Transform it to make the graph of $y = e^{-x} - 3$.

Give the range and domain of $y = e^{-x} - 3$ using interval notation.

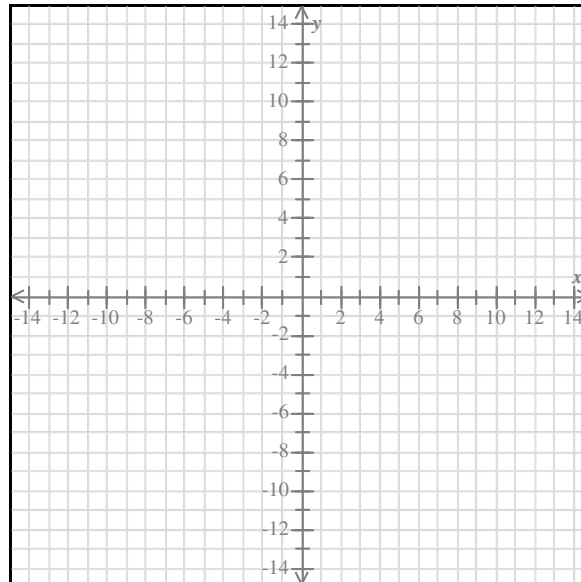


Question 16 of 36

Graph the following function.

$$g(x) = 4e^{x+2} - 3$$

To draw the graph, plot two points and the asymptotes (if any) of the graph. Then click on the graph icon.

**Question 17 of 36**

Use the ALEKS calculator to evaluate each expression.

Round your answers to the nearest thousandth.

Do not round any intermediate computations.

$$\left(\frac{5}{7}\right)^{-0.65} =$$

$$3.1^{1.9} =$$

Question 18 of 36

If the rate of inflation is 4.1% per year, the future price $p(t)$ (in dollars) of a certain item can be modeled by the following exponential function, where t is the number of years from today.

$$p(t) = 800(1.041)^t$$

Find the current price of the item and the price 9 years from today.

Round your answers to the nearest dollar as necessary.

Question 19 of 36

Use the ALEKS calculator to evaluate each expression.
Round your answers to the nearest thousandth.
Do not round any intermediate computations.

$$e^{-0.2} =$$
$$230e^{0.35} =$$

Question 20 of 36

A species of fish was added to a lake. The population size $P(t)$ of this species can be modeled by the following function, where t is the number of years from the time the species was added to the lake.

$$P(t) = \frac{2500}{1 + 5e^{-0.34t}}$$

Find the initial population size of the species and the population size after 7 years.
Round your answers to the nearest whole number as necessary.

Initial population size: fish

Population size after 7 years: fish

Question 21 of 36

Suppose that \$3500 is placed in an account that pays 16% interest compounded each year.
Assume that no withdrawals are made from the account.

Follow the instructions below. Do not do any rounding.

(a) Find the amount in the account at the end of 1 year. \$_____
(b) Find the amount in the account at the end of 2 years. \$_____

Question 22 of 36

Deshaun borrowed \$8000 at a rate of 15%, compounded monthly. Assuming he makes no payments, how much will he owe after 6 years?

Do not round any intermediate computations, and round your answer to the nearest cent.

Question 23 of 36

Moneysaver's Bank offers a savings account that earns 9% interest compounded *continuously*. If Deandre deposits \$3300, how much will he have in the account after three years, assuming he makes no withdrawals?

Do not round any intermediate computations, and round your answer to the nearest cent.

Question 24 of 36

The number of bacteria in a certain population is predicted to increase according to a *continuous exponential growth model*, at a relative rate of 18% per hour. Suppose that a sample culture has an initial population of 116 bacteria. Find the predicted population after four hours.

Do not round any intermediate computations, and round your answer to the nearest tenth.

_____ bacteria

Question 25 of 36

Use the ALEKS calculator to evaluate each expression.
Round your answers to the nearest thousandth.
Do not round any intermediate computations.

$$\log \frac{3}{7} =$$

$$\ln 23.4 =$$

Question 26 of 36

Rewrite each equation as requested.

- (a) Rewrite as a logarithmic equation.

$$2^{-5} = \frac{1}{32}$$

- (b) Rewrite as an exponential equation.

$$\log_5 5 = 1$$

(a) $\log_{\square} \square = \square$

(b) $\square^{\square} = \square$

Question 27 of 36

Rewrite each equation as requested.

- (a) Rewrite as a logarithmic equation.

$$e^6 = x$$

- (b) Rewrite as an exponential equation.

$$\ln 7 = y$$

Question 28 of 36

Evaluate each expression.

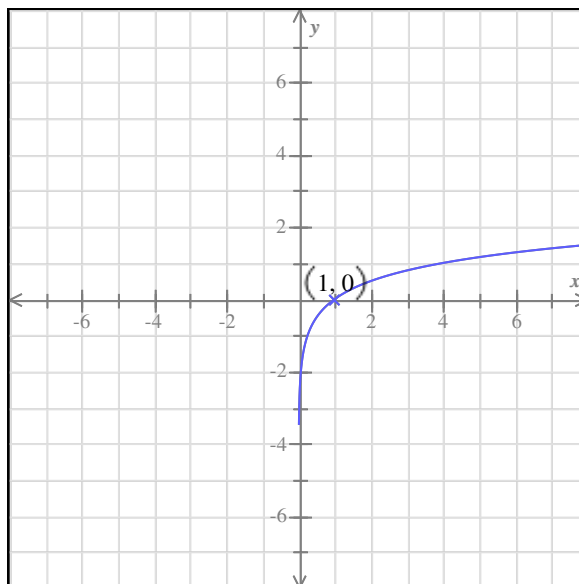
(a) $\log_7 49 = \square$

(b) $\log_3 \frac{1}{81} = \square$

Question 29 of 36

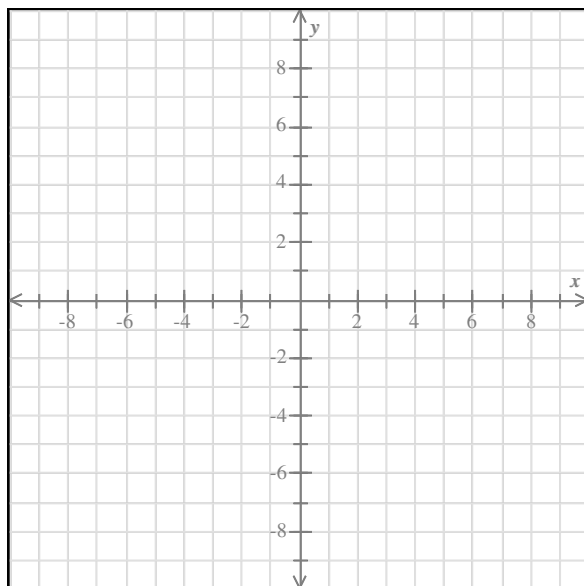
Below is the graph of $y = \log_4 x$.

Translate it to become the graph of $y = \log_4 (x + 1) + 4$.

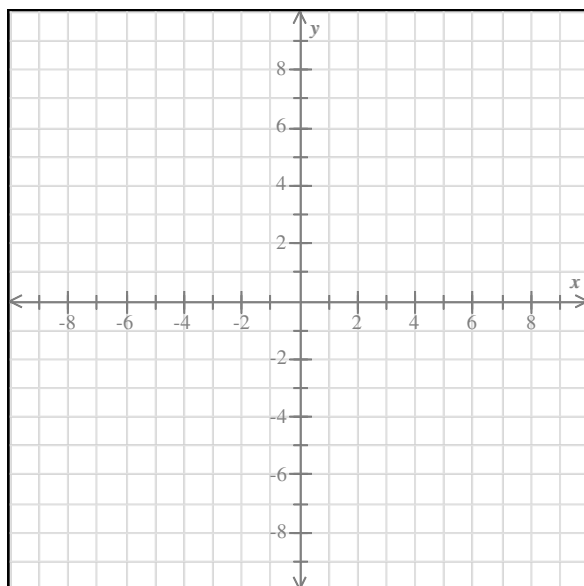


Question 30 of 36

Graph $g(x) = 4 + \log_3 x$.

**Question 31 of 36**

Graph the function $g(x) = \log_2(x - 3)$ and give its domain and range using interval notation.

**Question 32 of 36**

Find the domain of the function.

$$f(x) = \log_5 \sqrt{2x + 9}$$

Write your answer as an interval or union of intervals.

Question 33 of 36

Fill in the missing values to make the equations true.

(a) $\log_5 8 - \log_5 11 = \log_5 \square$

(b) $\log_8 5 + \log_8 \square = \log_8 55$

(c) $\log_6 25 = \square \log_6 5$

Question 34 of 36

Use the properties of logarithms to expand $\log \frac{z^6}{y}$.

Each logarithm should involve only one variable and should not have any exponents. Assume that all variables are positive.

Question 35 of 36

Write the expression as a single logarithm.

$$2\log_4 y - \frac{1}{5}\log_4 z + 5\log_4 x$$

Question 36 of 36

Use the change of base formula to compute $\log_4 7$.

Round your answer to the nearest thousandth.

Practice Problems for Exam 4 Version #1 Answers for class Lacoste College Algebra Fall 2019

Question 1 of 36

One-to-one?	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No
One-to-one?	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No

Question 2 of 36

<p>(a) $f(x) = \frac{3}{x}$, $x \neq 0$</p> <p>$g(x) = \frac{3}{x}$, $x \neq 0$</p> <p>$f(g(x)) = x$</p> <p>$g(f(x)) = x$</p> <p><input checked="" type="radio"/> f and g are inverses of each other</p> <p><input type="radio"/> f and g are <i>not</i> inverses of each other</p>	<p>(b) $f(x) = -x + 4$</p> <p>$g(x) = x + 4$</p> <p>$f(g(x)) = -x$</p> <p>$g(f(x)) = -x + 8$</p> <p><input type="radio"/> f and g are inverses of each other</p> <p><input checked="" type="radio"/> f and g are <i>not</i> inverses of each other</p>
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Question 3 of 36

	$g^{-1}(4) = -8$	
	$h^{-1}(x) = \frac{x-2}{3}$	
	$(h^{-1} \circ h)(-3) = -3$	

Question 4 of 36

$$f^{-1}(x) = 1 - (x - 3)^2 \text{ for the domain } [3, \infty)$$

Question 5 of 36

$$f^{-1}(x) = \sqrt[3]{1-x}$$

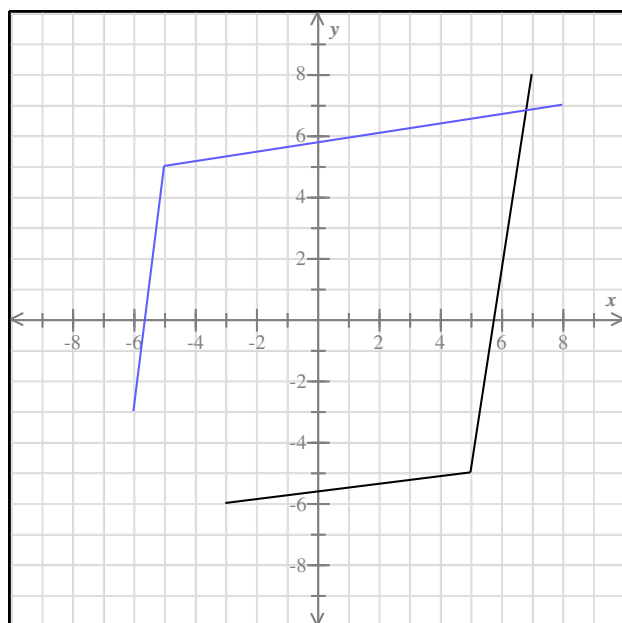
Question 6 of 36

$$h^{-1}(x) = \frac{5x}{7x-1}$$

$$\text{Domain of } h^{-1}: \left(-\infty, \frac{1}{7}\right) \cup \left(\frac{1}{7}, \infty\right)$$

$$\text{Range of } h^{-1}: \left(-\infty, \frac{5}{7}\right) \cup \left(\frac{5}{7}, \infty\right)$$

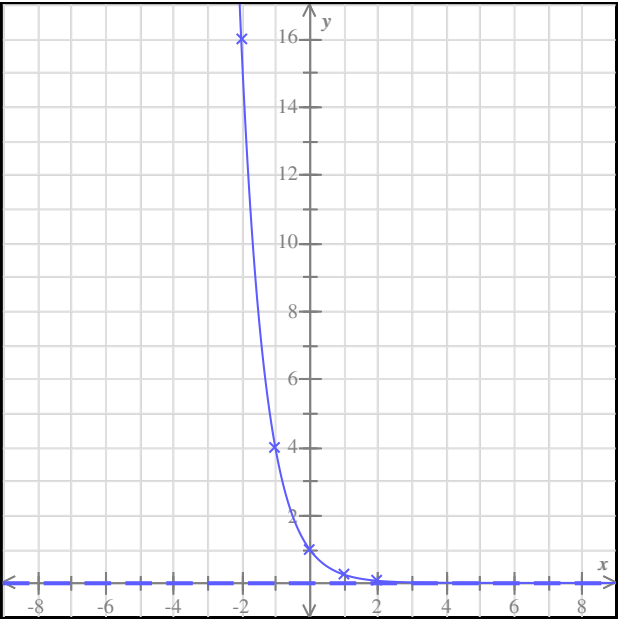
Question 7 of 36



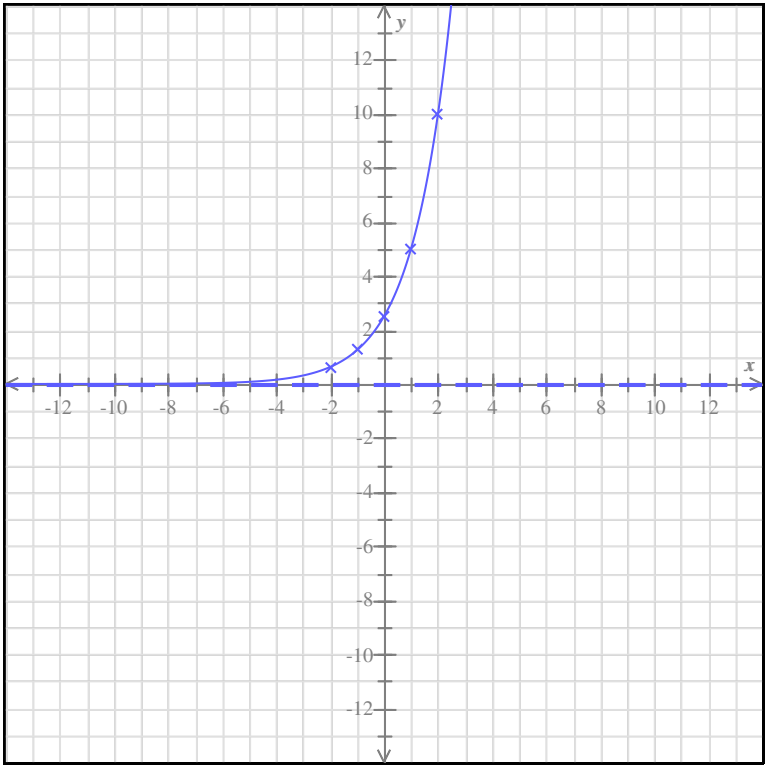
Question 8 of 36

x	$f(x)$
-2	$\frac{1}{25}$
-1	$\frac{1}{5}$
0	1
1	5
2	25

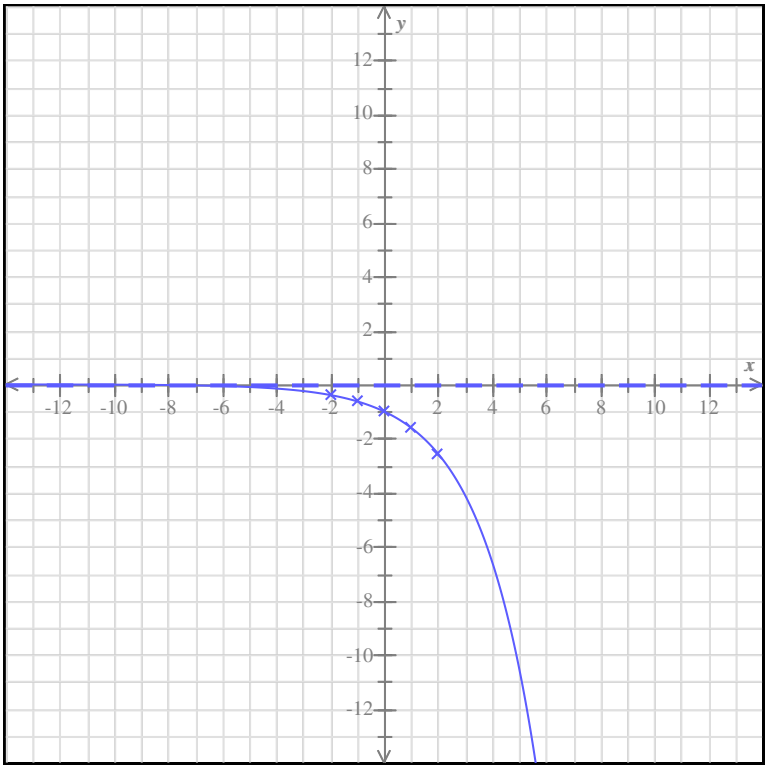
Question 9 of 36



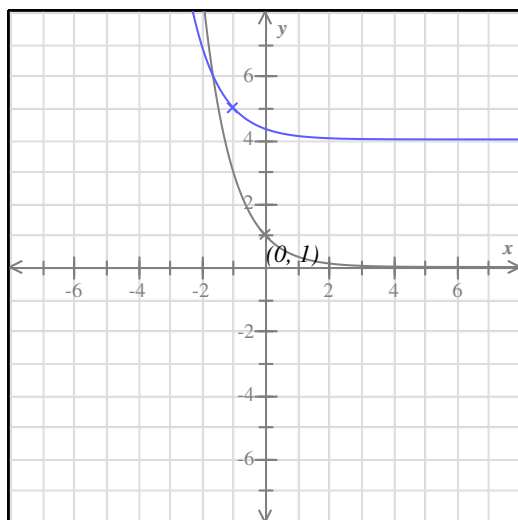
Question 10 of 36



Question 11 of 36



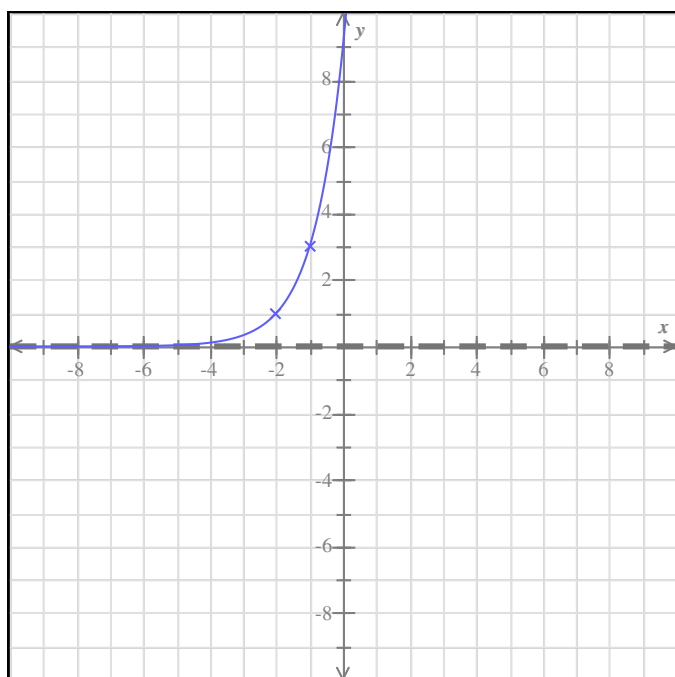
Question 12 of 36



Question 13 of 36

- (a) range: $y > -4$
- (b) domain: All reals

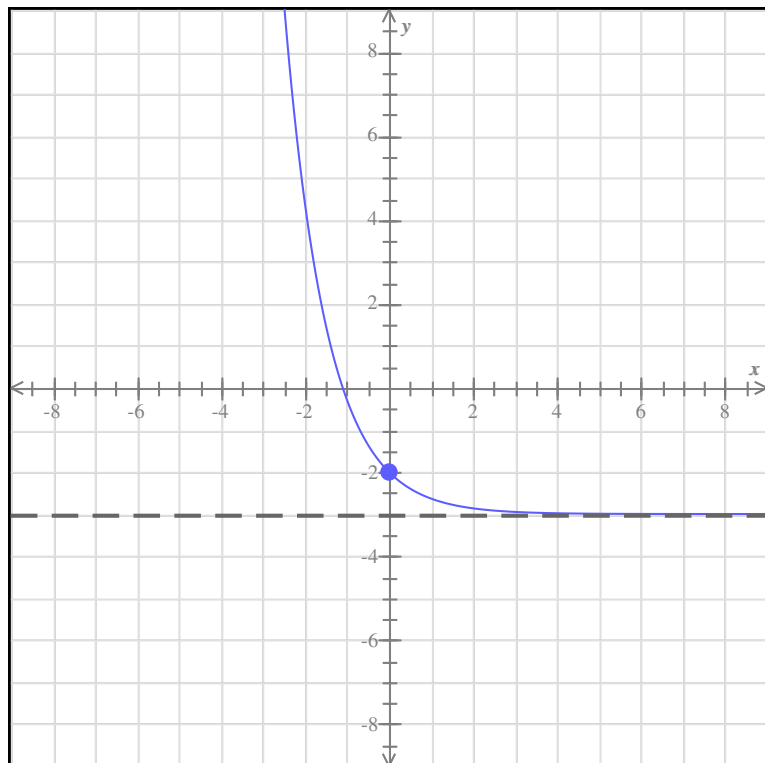
Question 14 of 36



Domain: $(-\infty, \infty)$

Range: $(0, \infty)$

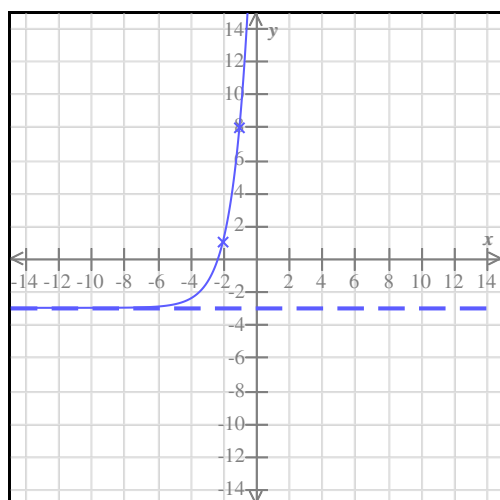
Question 15 of 36



Range: $(-3, \infty)$

Domain: $(-\infty, \infty)$

Question 16 of 36



Question 17 of 36

$$\left(\frac{5}{7}\right)^{-0.65} = 1.244$$

$$3.1^{1.9} = 8.582$$

Question 18 of 36

Current price: \$800

Price 9 years from today: \$1149

Question 19 of 36

$$e^{-0.2} = 0.819$$

$$230e^{0.35} = 326.386$$

Question 20 of 36

Initial population size: 417 fish

Population size after 7 years: 1709 fish

Question 21 of 36

(a) Find the amount in the account at the end of 1 year.

\$4060

(b) Find the amount in the account at the end of 2 years.

\$4709.60

Question 22 of 36

\$19,567.36

Question 23 of 36

\$4322.88

Question 24 of 36

238.3 bacteria

Question 25 of 36

$$\log \frac{3}{7} = -0.368$$

$$\ln 23.4 = 3.153$$

Question 26 of 36

(a) $\log_2 \frac{1}{32} = -5$

(b) $5^1 = 5$

Question 27 of 36

(a) $\ln_x = 6$

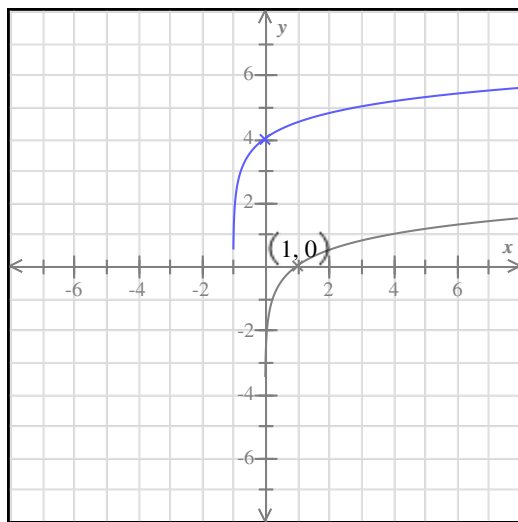
(b) $e^y = 7$

Question 28 of 36

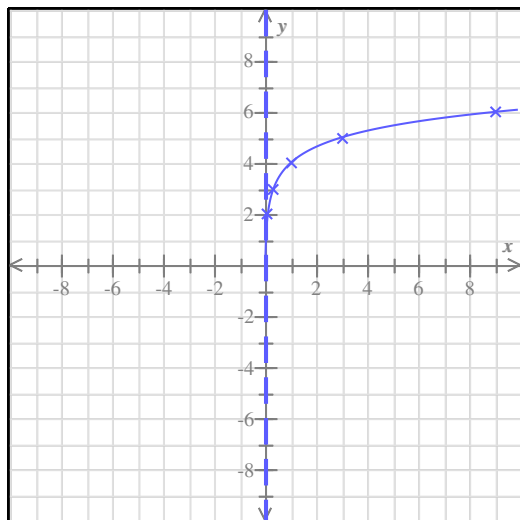
(a) $\log_7 49 = 2$

(b) $\log_3 \frac{1}{81} = -4$

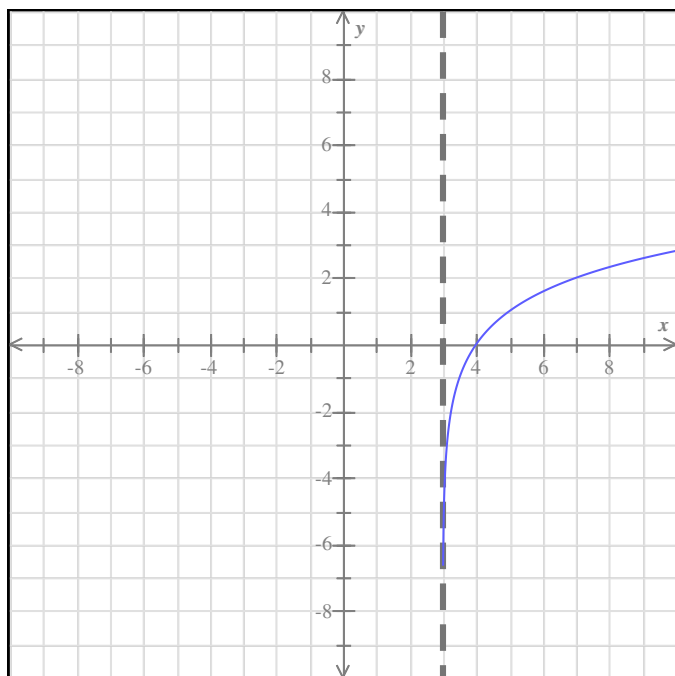
Question 29 of 36



Question 30 of 36



Question 31 of 36



Domain: $(3, \infty)$

Range: $(-\infty, \infty)$

Question 32 of 36

$$\text{Domain: } \left(-\frac{9}{2}, \infty\right)$$

Question 33 of 36

$$(a) \log_5 8 - \log_5 11 = \log_5 \frac{8}{11}$$

$$(b) \log_8 5 + \log_8 11 = \log_8 55$$

$$(c) \log_6 25 = 2\log_6 5$$

Question 34 of 36

$$\log \frac{z^6}{y} = 6 \log z - \log y$$

Question 35 of 36

$$\log_4 \left(\frac{y^2 x^5}{z^{\frac{1}{5}}} \right)$$

Question 36 of 36

$$1.404$$