

Name: _____ Class: _____ Date: _____

ID: A

Algebra II Practice Quiz 7.1 - 7.3

- _____ 1. (1 point)
A initial investment of \$10,000 grows at 11% per year. What function represents the value of the investment after t years?
- A) $f(t) = 10000(0.11)^t$ C) $f(t) = 10000(1.11)t$
B) $f(t) = 10000(12)^t$ D) $f(t) = 10000(1.11)^t$

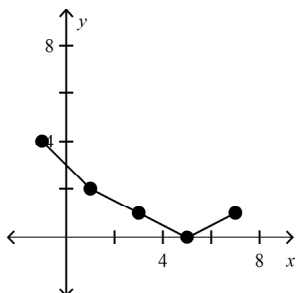
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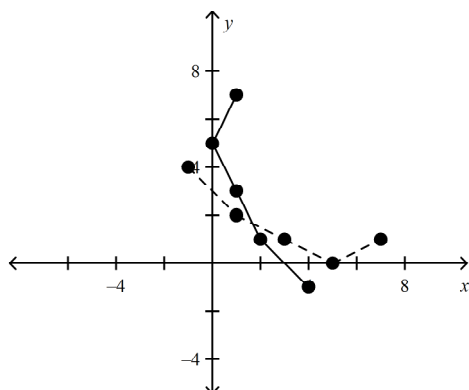
2. (1 point)

Graph the inverse of the relation. Identify the domain and range of the inverse.

x	-1	1	3	5	7
y	4	2	1	0	1

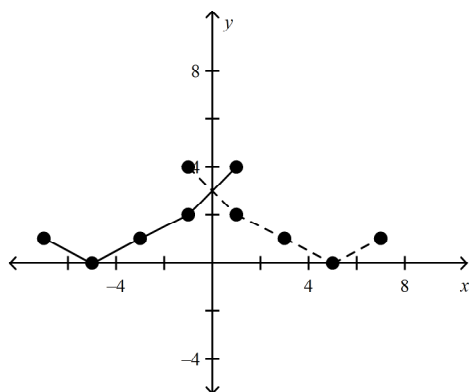


A)



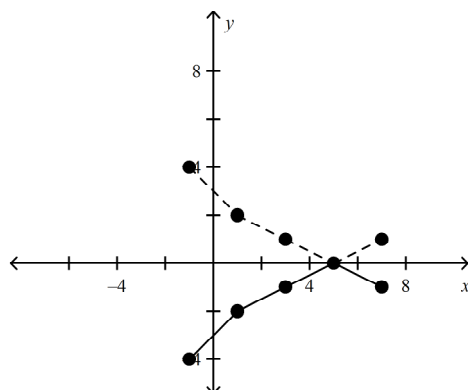
Domain: $\{x \mid 0 \leq x \leq 4\}$;
Range: $\{y \mid -1 \leq y \leq 7\}$

B)



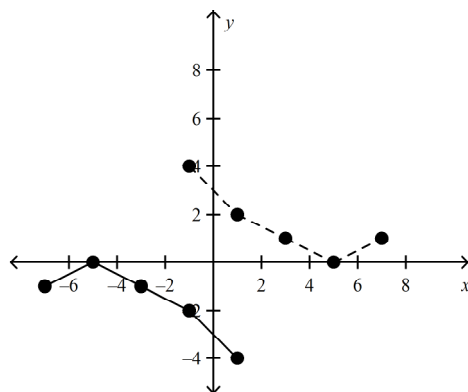
Domain: $\{x \mid -7 \leq x \leq 1\}$;
Range: $\{y \mid 0 \leq y \leq 4\}$

C)



Domain: $\{x \mid -1 \leq x \leq 7\}$;
Range: $\{y \mid -4 \leq y \leq 1\}$

D)



Domain: $\{x \mid -7 \leq x \leq 1\}$;
Range: $\{y \mid -4 \leq y \leq 0\}$

3. (1 point)

Use inverse operations to write the inverse of $f(x) = x - \frac{1}{7}$.

A) $f(x) = x - \frac{1}{7}$

C) $f(x) = x - \frac{6}{7}$

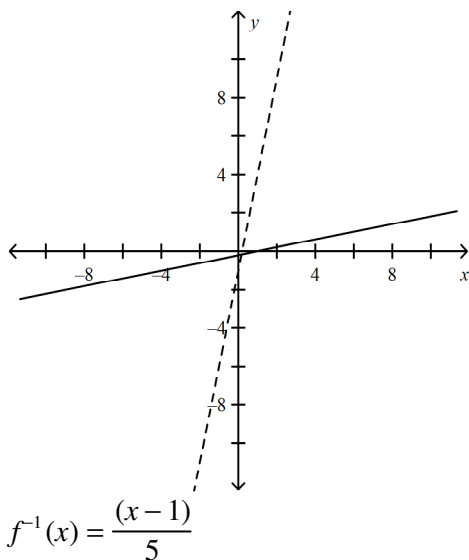
B) $f(x) = x + \frac{6}{7}$

D) $f(x) = x + \frac{1}{7}$

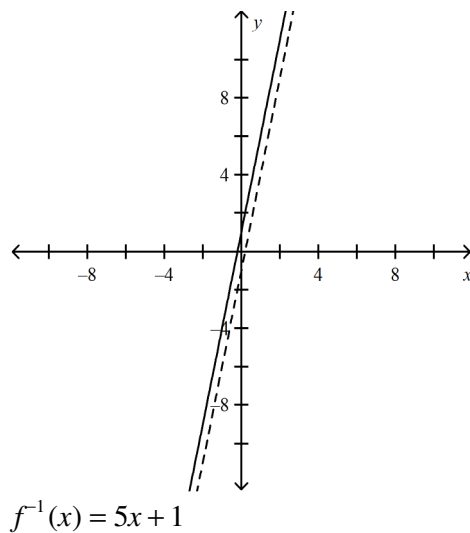
4. (1 point)

Graph $f(x) = 5x - 1$. Then, write and graph the inverse.

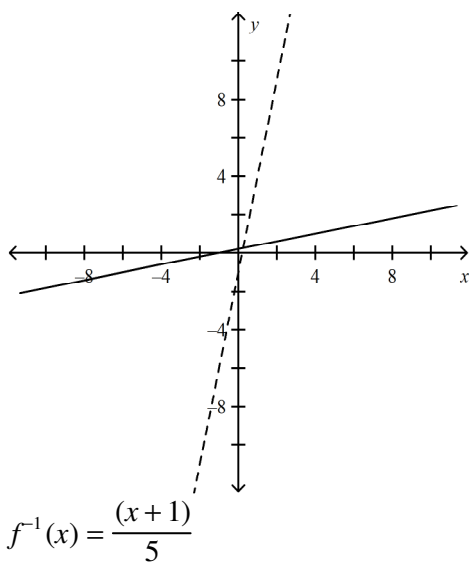
A)



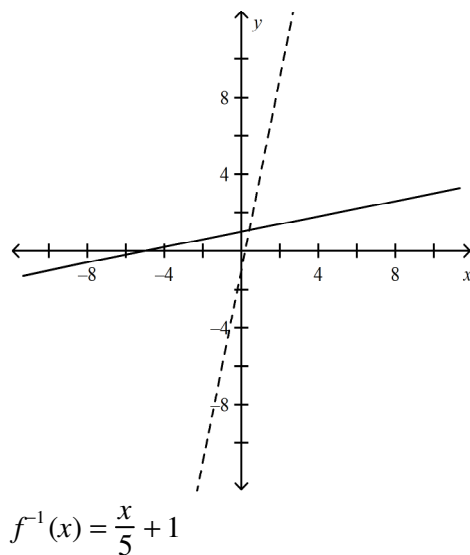
C)



B)



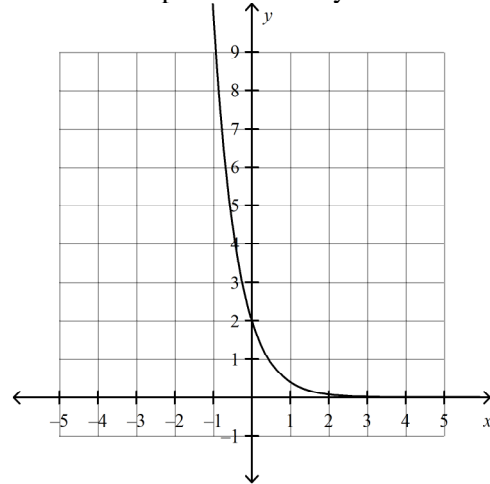
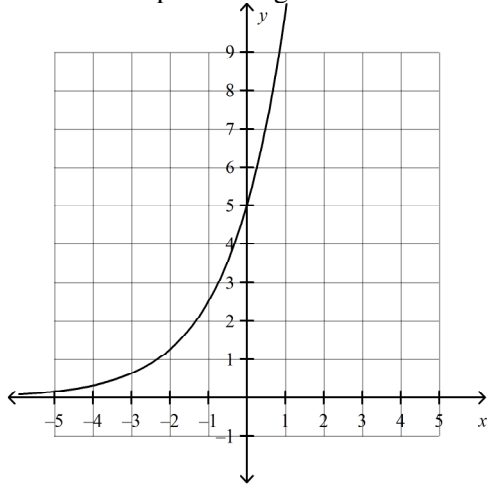
D)



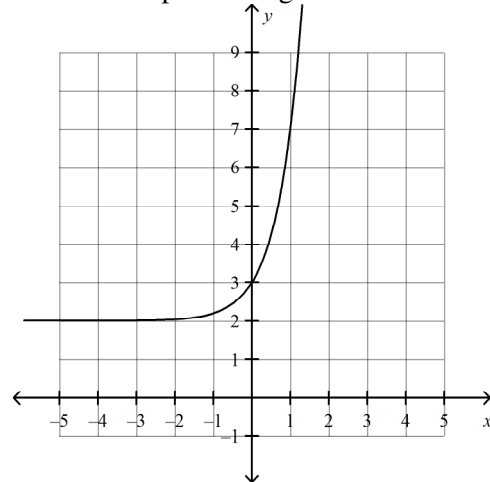
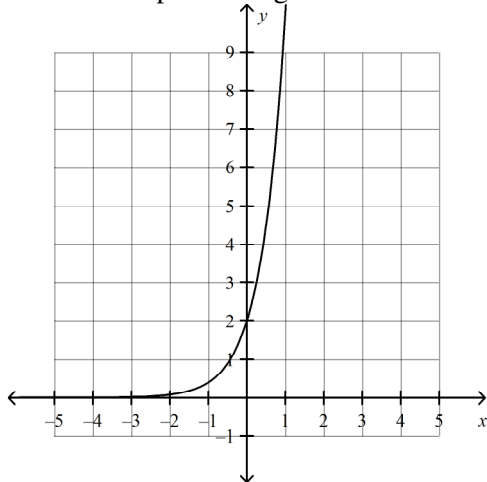
_____ 11. (10 points)

Tell whether the function $y = 2(5)^x$ shows growth or decay.

A) This is an exponential growth function. C) This is an exponential decay function.



B) This is an exponential growth function. D) This is an exponential growth function.



_____ 12. (10 points)

Mira bought \$300 of Freerange Wireless stock in January of 1998. The value of the stock is expected to increase by 7.5% per year.

Use logarithms or guess-and-check to predict the year the value of Mira's stock will reach \$700.

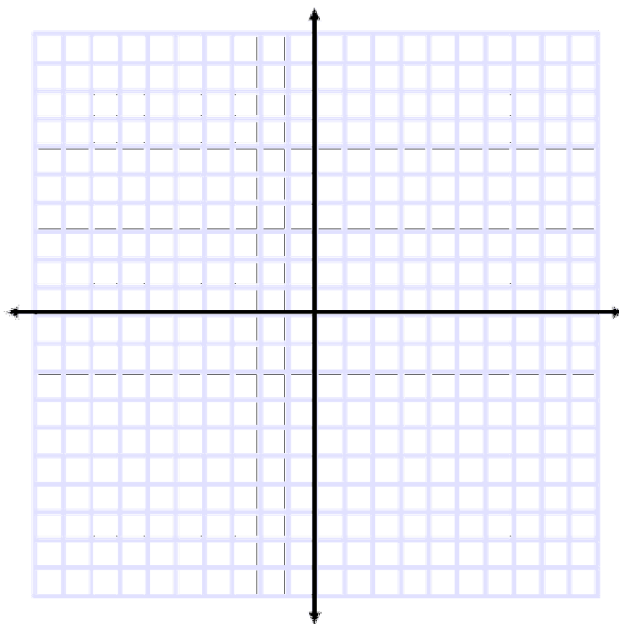
- | | |
|---------|---------|
| A) 1999 | C) 2009 |
| B) 2004 | D) 2014 |

Name: _____

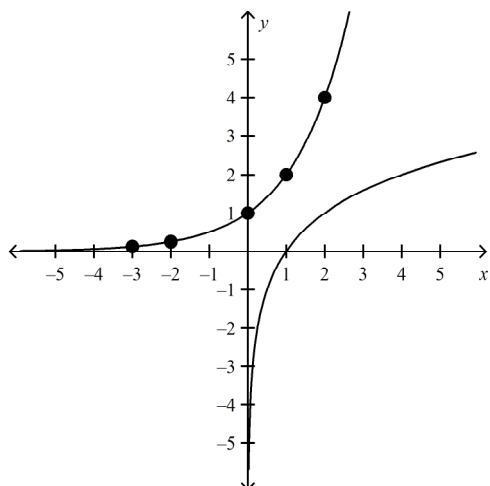
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_____ **13.** (10 points)

Use $x = -3, -2, 0, 1, 2$ to graph the function $f(x) = 2^x$. Then graph its inverse.

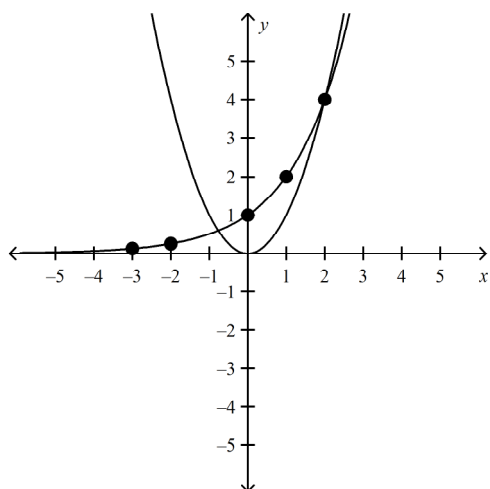


A)



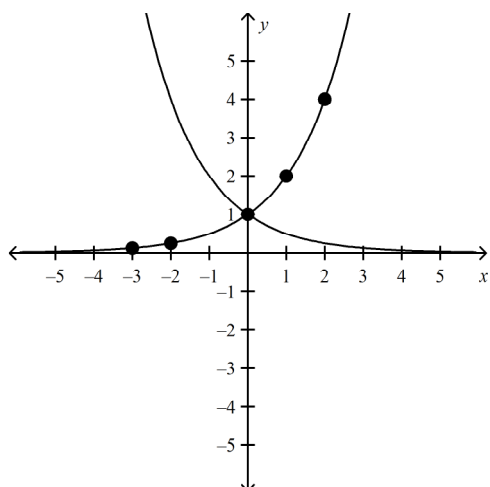
The domain of $f^{-1}(x)$ is $\{x|x > 0\}$, and the range is all real numbers.

B)



The domain of $f^{-1}(x)$ is all real numbers, and the range is $\{y|y \geq 0\}$.

C)

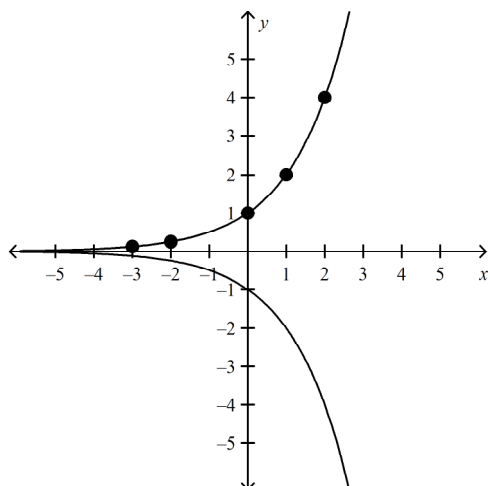


The domain of $f^{-1}(x)$ is all real numbers, and the range is $\{y|y > 0\}$.

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D)



The domain of $f^{-1}(x)$ is all real numbers, and the range is $\{y|y < 0\}$.

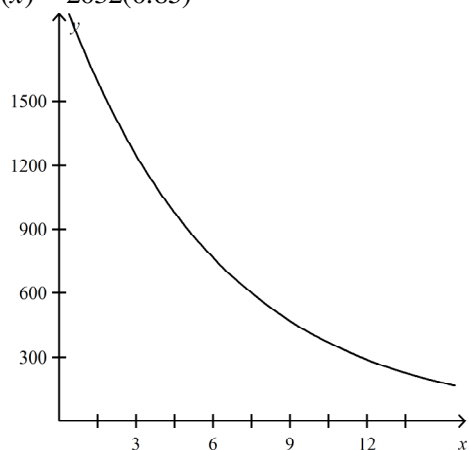
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_____ 14. (10 points)

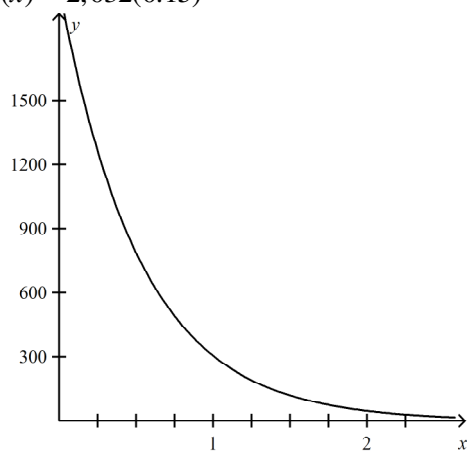
A bacteria population starts at 2,032 and decreases at about 15% per day. After how many days will there be *fewer* than 321 bacteria?

A) $f(x) = 2032(0.85)^t$



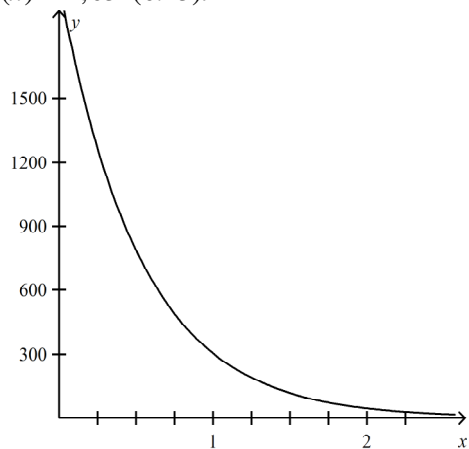
After about 11.3 days, there will be fewer than 321 bacteria.

B) $f(x) = 2,032(0.15)^t$



After about 0.97 days, there will be fewer than 321 bacteria.

C) $f(x) = 2,032(0.15)^t$

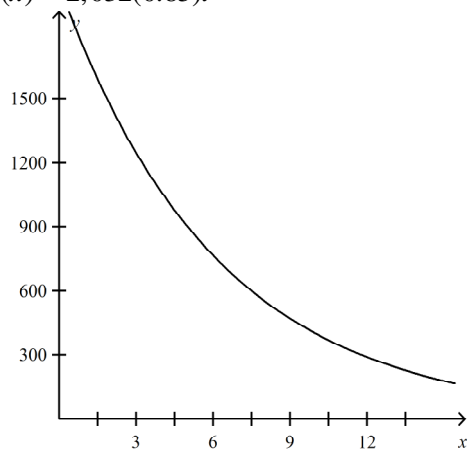


After about 1.05 days, there will be fewer than 321 bacteria.

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D) $f(x) = 2,032(0.85)^t$



After about 0.19 days, there will be fewer than 321 bacteria.

Algebra II Practice Quiz 7.1 - 7.3

Answer Section

MULTIPLE CHOICE

1. ANS: D

The investment follows an exponential growth of 11% per year with an initial value of \$10,000. Using the formula $f(t) = P(1 + r)^t$, substitute the given values.

$$f(t) = 10000(1 + 11\%)^t$$

$$f(t) = 10000(1 + 0.11)^t$$

$$f(t) = 10000(1.11)^t$$

PTS: 1

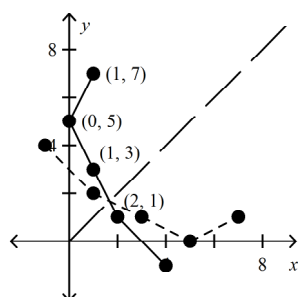
2. ANS: A

For the inverse relation, switch the x and y -values in each ordered pair.

x	4	2	1	0	1
y	-1	1	3	5	7

Graph each point and connect the points.

The inverse is the reflection of the original relation across the line $y = x$.



Domain: $\{x \mid 0 \leq x \leq 4\}$; Range: $\{y \mid -1 \leq y \leq 7\}$

PTS: 1

REF: Page 498

3. ANS: D

$$f(x) = x - \frac{1}{7}$$

The number $\frac{1}{7}$ is subtracted from x .

$$f^{-1}(x) = x + \frac{1}{7}$$

Add $\frac{1}{7}$ to x to write the inverse.

PTS: 1

REF: Page 499

4. ANS: B

Set $y = f(x)$. $y = 5x - 1$ Switch x and y . $x = 5y - 1$ Solve for y . $x + 1 = 5y$ So, $\frac{(x+1)}{5} = y$.Write in $y =$ form. $y = \frac{(x+1)}{5}$ Write the inverse. $f^{-1}(x) = \frac{(x+1)}{5}$

PTS: 1

REF: Page 500

5. ANS: C

$$c = 1.09(p + 4)$$

Cost c is a function of price p .

$$c = 1.09p + 4.36$$

Distribute.

$$c - 4.36 = 1.09p$$

Subtract 4.36 from both sides.

$$\frac{c - 4.36}{1.09} = p$$

Divide to isolate p .

$$\frac{222.36 - 4.36}{1.09} = p$$

Substitute 222.36 for c .

$$200 = p$$

Simplify.

The clerk should mark the price on the tag as \$200.00.

PTS: 1

REF: Page 500

6. ANS: C

$$4^? = \frac{1}{16}$$

The log is the exponent.

$$4^{-2} = \frac{1}{16}$$

Think: What power of the base is the number?

$$\log_4 \frac{1}{16} = -2$$

PTS: 1

REF: Page 506

7. ANS: C

$$f(x) = \frac{x}{4} + (-5)$$

The variable, x , is divided by 4, then -5 is added.

$$f^{-1}(x) = 4(x - (-5))$$

Undo the addition by subtracting -5 . Undo the division by multiplying by 4.

$$f^{-1}(x) = 4(x + 5)$$

PTS: 10

REF: Page 499

8. ANS: B

Logarithmic form: $\log_4 16 = 2$ Exponential form: $4^2 = 16$

The base of the logarithm becomes the base of the power, and the logarithm is the exponent.

PTS: 10

REF: Page 506

9. ANS: B

The base of the exponent becomes the base of the logarithm.

The exponent is the logarithm.

$$2^3 = 8 \text{ becomes } \log_2 8 = 3.$$

PTS: 10

REF: Page 505

10. ANS: B

$$\text{pH} = -\log[\text{H}^+]$$

$$\text{pH} = -\log(0.0000019)$$

Substitute the known values in the function.

Use a calculator to find the value of the logarithm in base 10. Press the [LOG] key.

The stream water has a pH of about 5.7. Atlantic Salmon returning to their natal streams will be able to reproduce this year!

PTS: 10

REF: Page 508

11. ANS: B

Step 1 Find the value of the base: 5.

The base is greater than 1. So, this is an exponential growth function.

Step 2 Choose several values of x and generate ordered pairs. Then, graph the ordered pairs and connect with a smooth curve.

PTS: 10

REF: Page 491

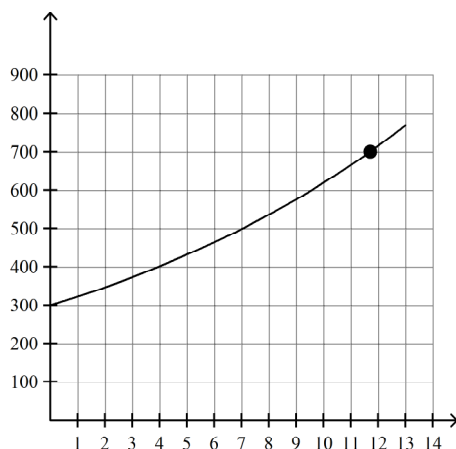
12. ANS: C

Step 1 Write a function to model the expected growth in value of the stock.

$$f(t) = a(1 + r)^t$$

Exponential growth function

$$f(t) = 300(1 + 0.075)^t$$

Substitute 300 for a and 0.075 for r .**Step 2** Graph the function.**Step 3** Use the graph to predict when the value of the stock will reach \$700. Use the [TRACE] feature to find the t -value when $f(t) \approx 700$.The value of the function is approximately \$700 when $t \approx 11.72$. Thus, the stock will be worth \$700 about 11.72 years after it was bought, or sometime in 2009.

PTS: 10

REF: Page 492

13. ANS: A

Graph $f(x) = 2^x$ using a table of values.

x	-3	-2	0	1	2
$f(x) = 2^x$	$\frac{1}{8}$	$\frac{1}{4}$	1	2	4

To graph the inverse $f^{-1}(x) = \log_2 x$, reverse each ordered pair.

x	$\frac{1}{8}$	$\frac{1}{4}$	1	2	4
$f^{-1}(x) = \log_2 x$	-3	-2	0	1	2

The domain of $f^{-1}(x)$ is $\{x | x > 0\}$ and the range is all real numbers.

PTS: 10

REF: Page 507

14. ANS: A

$$f(x) = a(1 - r)^t$$

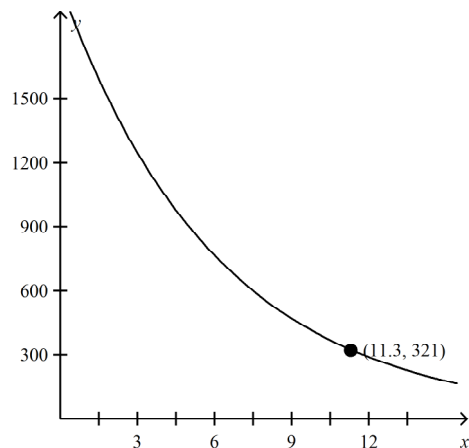
$$f(x) = 2,032(1 - 0.15)^t$$

$$f(x) = 2,032(0.85)^t$$

Write exponential decay function.

Substitute 2032 for a and 0.15 for r .

Simplify.



After about 11.3 days, there will be fewer than 321 bacteria.

PTS: 10

REF: Page 492