

 **Take Assessment: Exam 4****Name** Exam 4**Instructions****Multiple Attempts** This Test allows 2 attempts. This is attempt number 1.**Force Completion** This Test can be saved and resumed later.▼ **Question Completion Status:****Question 1****5 points**[Save](#)**Solve the problem.**

The half-life of plutonium-234 is 9 hours. If 70 milligrams is present now, how much will be present in 6 days? (Round your answer to three decimal places.)

- 0.689
- 44.096
- 0.001
- 23.091

Question 2**5 points**[Save](#)**Solve the problem.**

$\text{pH} = -\log_{10}[\text{H}^+]$ Find the pH if the $[\text{H}^+] = 9.6 \times 10^{-6}$.

- 6.02
- 5.02
- 6.98
- 5.98

Question 3**5 points**[Save](#)**Find the inverse of the function.**

$\{(13, 5), (11, 6), (9, 7), (7, 8)\}$

$$\left\{ \left(13, \frac{1}{5} \right), \left(11, \frac{1}{6} \right), \left(9, \frac{1}{7} \right), \left(7, \frac{1}{8} \right) \right\}$$

$\{(6, 5), (8, 9), (13, 9), (6, 7)\}$

$\{(5, 13), (6, 11), (7, 9), (8, 7)\}$

$\{(6, 5), (5, 9), (13, 11), (6, 7)\}$

Question 4**5 points**[Save](#)**Solve the problem.**

A fossilized leaf contains 12% of its normal amount of carbon 14. How old is the fossil (to the nearest year)? Use 5600 years as the half-life of carbon 14.

- 1031
- 17,099
- 20,040
- 36,108

Question 5**5 points**

For the functions f and g and the number c , compute $(f \circ g)(c)$.

$$\begin{aligned} f(x) &= 18x^2 - 3x \\ g(x) &= 20x - 2 \\ c &= 9 \end{aligned}$$

- 28,618
- 541,160
- 254,718
- 569,778

Question 6**5 points**

Find the exact value of the logarithmic expression.

$$\log_4 \frac{1}{64}$$

- 3
- $\frac{1}{3}$
- 3
- $-\frac{1}{3}$

Question 7**5 points**

Express as a single logarithm.

$$40 \log_5 \sqrt[5]{x} + \log_5(40x^6) - \log_5 40$$

- $\log_5 x^{14/5}$
- $\log_5 x^{14}$
- $\log_5 x^{13/6}$
- $\log_5 x^{11/8}$

Question 8**5 points**

Find the effective rate of interest.

$6\frac{1}{4}\%$ compounded monthly

6.39%

6.43%

6.25%

6.29%

Question 9

5 points

Save

Solve the equation.

$$3125^x = 25$$

$$\left\{\frac{1}{5}\right\}$$

$$\left\{\frac{1}{2}\right\}$$

$$\left\{\frac{5}{2}\right\}$$

$$\left\{\frac{2}{5}\right\}$$

Question 10

5 points

Save

Find the domain of the composite function $f \circ g$.

$$f(x) = \sqrt{2-x}; g(x) = |2x-1|$$

all real numbers

$$\left\{x \mid -\frac{1}{2} \leq x \leq \frac{3}{2}\right\}$$

$$\{x \mid x \leq 2\}$$

$$\{x \mid x \geq 2\}$$

Question 11

5 points

Save

Solve the problem.

The Feldmans bought their first house for \$18,000. Over the years they moved three times into bigger and bigger houses. Now, 45 years later, they are ready to retire and want a smaller house like the first one they bought. If inflation in property values has averaged 3.2% per year during that time, how much will such a house cost them now? (Round your answer to the nearest dollar.)

\$75,973

\$4362

\$74,278

\$4265

Question 12

5 points

Find the present value. Round to the nearest cent.

To get \$6,500 after 8 years at 10% compounded quarterly

\$3032.30

\$3023.25

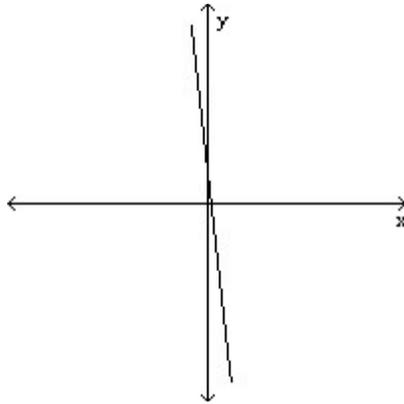
\$2949.51

\$3550.49

Question 13

5 points

Use the horizontal line test to determine whether the function is one-to-one.



Yes

No

Question 14

5 points

If the following defines a one-to-one function, find the inverse.

$\{(6, 6), (12, 7), (10, 8), (8, 9)\}$

$\{(7, 6), (9, 10), (6, 10), (7, 8)\}$

$\{(7, 6), (6, 10), (6, 12), (7, 8)\}$

Not a one-to-one function

$\{(6, 6), (7, 12), (8, 10), (9, 8)\}$

Question 15

5 points

Find the amount that results from the investment.

\$480 invested at 16% compounded quarterly after a period of 4 years

\$864.45

\$419.03

\$869.11

\$899.03

Question 16**5 points**[Save](#)**Solve the problem.**

The amount of a certain drug in the bloodstream is modeled by the function $y = y_0 e^{-0.40t}$, where y_0 is the amount of the drug injected (in milligrams) and t is the elapsed time (in hours). Suppose that 10 milligrams are injected at 10:00 A.M. If a second injection is to be administered when there is 1 milligram of the drug present in the bloodstream, approximately when should the next dose be given? Express your answer to the nearest quarter hour.

12:30 P.M

3:45 P.M

5:45 P.M

5: 30 P.M

Question 17**5 points**[Save](#)**Find the domain of the function.**

$$f(x) = 2 - \ln(7x)$$

 $(7, \infty)$ $(-\infty, 2) \cup (7, \infty)$ $(-2, 7)$ $(0, \infty)$ **Question 18****5 points**[Save](#)**Find the domain of the composite function $f \circ g$.**

$$f(x) = \frac{18}{x}; g(x) = \frac{1}{x-2}$$

 $\{x \mid x \neq 0, x \neq 2, x \neq 9\}$ $\{x \mid x \text{ is any real number}\}$ $\{x \mid x \neq 2, x \neq 0\}$ $\{x \mid x \neq 2\}$ **Question 19****5 points**[Save](#)**Solve the problem.**

Conservationists tagged 90 black-nosed rabbits in a national forest in 1990. In 1993, they tagged 180 black-nosed rabbits in the same range. If the rabbit population follows the exponential law, how many rabbits will be in the range 4 years from 1990?

151

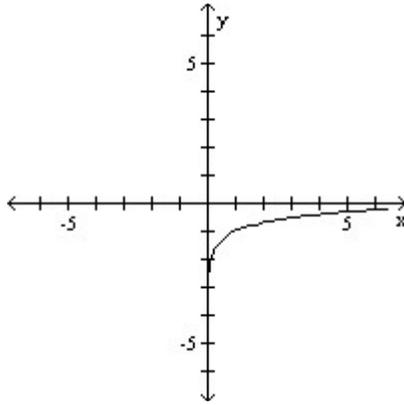
303

227

454

Question 20**5 points**

The graph of a logarithmic function is shown. Select the function which matches the graph.



$$y = \log(x) - 1$$

$$y = \log(1 - x)$$

$$y = 1 - \log(x)$$

$$y = \log(x - 1)$$