

Question 1

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a. Identify the horizontal asymptote (if any).**b. If the graph of the function has a horizontal asymptote, determine the point where the graph crosses the horizontal asymptote.**

$$f(x) = \frac{x^2 - 7x^2 + 1}{8x + 7}$$

Select one:

- a. **a.** $y = 0$
b. $(\frac{1}{7}, 0)$
- b. **a.** $y = \frac{1}{8}$
b. $(\frac{1}{7}, \frac{1}{8})$
- c. **a.** $y = 1$
b. $(\frac{1}{7}, 1)$
- d. **a.** No horizontal asymptote
b. Not applicable

MAT101_MH_V6 | [Topic 14: Solving Linear Systems Using Augmented Matrices](#)**Question 2**

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a. Identify the horizontal asymptote (if any).**b. If the graph of the function has a horizontal asymptote, determine the point where the graph crosses the horizontal asymptote.**

$$s(x) = \frac{5x - 10}{x^2 + 5x - 4}$$

Select one:

- a. **a.** $y = 0$
b. $(2, 0)$
- b. **a.** $y = 0$
b. $(-\frac{5}{2}, 0)$
- c. **a.** $y = 2$
b. $(0, 2)$
- d. **a.** No horizontal asymptote
b. Not applicable

Question **3**

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question

Determine the vertical asymptote(s) of the graph of the function.

$$f(a) = \frac{a^2 + 4}{a^2 + 3a - 5}$$

Select one:

- a. $a = -\frac{5}{3}$
- b. $a = \frac{-3 + \sqrt{29}}{2}$ and $a = \frac{-3 - \sqrt{29}}{2}$
- c. $a = 2$ and $a = -2$
- d. None

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Question **4**

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question

Solve the inequality. Write the solution set in interval notation.

$$\frac{3x-4}{3+2x} < 0$$

Select one:

- a. $(-\frac{4}{3}, \frac{3}{2})$
- b. $(-\frac{3}{2}, \frac{4}{3})$
- c. $(-\infty, -\frac{3}{2}) \cup (\frac{4}{3}, \frac{3}{2})$
- d. $(-\infty, -\frac{4}{3}) \cup (\frac{3}{2}, -\infty)$

Question 5

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Solve the problem.

The average round trip speed S (in mph) of a vehicle traveling a distance of d miles in each direction is given by $S = \frac{2d}{\frac{d}{r_1} + \frac{d}{r_2}}$ where r_1 and r_2 are the rates of speed for the initial trip and the return trip, respectively. Suppose a motorist travels 100 miles to an event and averages 50 mph for the trip to the event. Determine the average speed necessary for the return trip if the motorist wants the average speed for the round trip to be at least 60 mph. Round to one decimal place, if necessary.

Select one:

- a. The motorist must average a speed of at least 70 mph on the return trip.
- b. The motorist must average a speed of at least 55 mph on the return trip.
- c. The motorist must average a speed of at least 75.0 mph on the return trip.
- d. The motorist must average a speed of at least 65 mph on the return trip.

Question 6

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question

Solve the problem.

The population of a country in 2010 was approximately 35 million with an annual growth rate of 0.804%. At this rate, the population $P(t)$ (in millions) can be approximated by $P(t) = 35(1.00809)^t$ where t is the time in years since 2010.

- a. Evaluate $P(0)$ and interpret its meaning in the context of this problem.
- b. Evaluate $P(6)$ and interpret its meaning in the context of this problem. Round the population value to the nearest million.

Select one:

- a. a. The initial population in 2010 was approximately 35 million.
b. The population in 2,016 will be approximately 37 million more people.
- b. a. The population increases by approximately 35 million in the first year.
b. The population in 2,016 will be approximately 38 million.
- c. a. The population increases by approximately 35 million in the first year.
b. The population in 2,016 will be approximately 38 million more people.
- d. a. The initial population in 2010 was approximately 35 million.
b. The population in 2,016 will be approximately 37 million.

Question 7

Not yet answered

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Simplify the expression.

$$\log 0.00001$$

Select one:

- a. $\frac{1}{4}$
- b. $\frac{1}{5}$
- c. -4
- d. -5

Question 8

Not yet answered

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Write the logarithm as a sum or difference of logarithms. Simplify each term as much as possible.

$$\log_2 \sqrt[4]{\frac{x}{3}}$$

Select one:

- a. $\log_2 x - \log_2 4 - 1$
- b. $\log_2 \sqrt[4]{x} - \log_2 \sqrt[4]{3}$
- c. $\frac{1}{4} \log_2 x - 1$
- d. $\frac{1}{4} \log_2 x - \frac{1}{4}$

Question 9

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question

Solve the problem.

Carbon dating determines the approximate age of an object made from materials that were **once** alive by measuring the remaining percentage of a radioactive isotope, **carbon-14**. The age is calculated using the formula

$$A = -\frac{\ln P}{0.000121}$$

where P is the percentage of remaining **carbon-14** (in decimal form). A specimen is determined to be 2,800 years old. What is the percentage of remaining **carbon-14**? Round to the nearest tenth of a percent.

Select one:

- a. 31.3%
- b. 51.3%
- c. 71.3%
- d. 84.3%

Question 10

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question

Solve the problem.

After a new product is launched the cumulative sales $S(t)$ (in \$1000) t weeks after launch is given by:

$$S(t) = \frac{64}{1 + 8e^{-0.47t}}$$

What is the limiting value in sales?

Select one:

- a. \$47,000
- b. \$6,000
- c. \$64,000
- d. \$8,000

Question 11

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question**Solve the problem.**

A fishing boat travels 36 mi with the current in 2 hr. It travels 42 mi against the current in 3 hr. Find the speed of the boat in still water.

Select one:

- a. The boat travels 18 mph in still water.
- b. The boat travels 14 mph in still water.
- c. The boat travels 16 mph in still water.
- d. The boat travels 2 mph in still water.

Question 12

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question

Solve the system by using any method. If a system does not have one unique solution, state whether the system is inconsistent or whether the equations are dependent.

$$\begin{aligned}5x + y &= -5 \\ -15x - 3y &= 9\end{aligned}$$

Select one:

- a. $\{(x, y) \mid 5x + y = -5\}$; The equations are dependent.
- b. $\{(1, -10)\}$
- c. $\{\}$; The system is inconsistent.
- d. $\{(0, -5)\}$

Question 13

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question**Solve the problem.**

A pharmacist wants to mix a 16% saline solution with a 26% saline solution to get 15 L of a 20% saline solution. How much of each solution should she use?

Select one:

- a. 9 L of the 16% solution; 6 L of the 26% solution
- b. 10 L of the 16% solution; 5 L of the 26% solution
- c. 6 L of the 16% solution; 9 L of the 26% solution
- d. 5 L of the 16% solution; 10 L of the 26% solution

Question 14

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question**Solve the problem.**

Josie invested \$13,000 in three different mutual funds. A fund containing large cap stocks made 5.7% return in 1 yr. A real estate fund lost 12.6% in 1 yr, and a bond fund made 3.5% in 1 yr. The amount invested in the large cap stock fund was twice the amount invested in the real estate fund. If Josie had a net return of \$162.50 across all investments, how much did she invest in the large cap fund?

Select one:

- a. She invested \$5,500 in the large cap fund.
- b. She invested \$5,000 in the large cap fund.
- c. She invested \$8,000 in the large cap fund.
- d. She invested \$2,500 in the large cap fund.

Question 15

Not yet answered

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Solve the problem.

The perimeter of a triangle is 55 in. The shortest side is 16 in. less than the longest side. The middle side is 13 in. less than the combined lengths of the shortest and longest sides. Find the lengths of the three sides.

Select one:

- a. The sides are 11 in., 21 in., and 27 in.
- b. The sides are 9 in., 23 in., and 27 in.
- c. The sides are 11 in., 23 in., and 25 in.
- d. The sides are 9 in., 21 in., and 25 in.

Question 16

Not yet answered

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Flag question

Solve the system using Gaussian elimination or Gauss-Jordan elimination.

$$-5x + 9y - 9z = -106$$

$$2x - 2y - 5z = -14$$

$$-5x - 8y + 2z = 11$$

Select one:

- a. $\{(5, -3, 6)\}$
- b. $\{(-3, 5, 6)\}$
- c. $\{(-5, 3, 6)\}$
- d. $\{(-3, -5, -6)\}$

Question 17Not yet
answeredPoints out of
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question

Find the partial fraction decomposition for the given rational expression. Use the technique of Gaussian elimination to find A, B, and C.

$$\frac{-3x^2+7x-10}{(x+2)(x-1)^2} = \frac{A}{x+2} + \frac{B}{x-1} - \frac{C}{(x-1)^2}$$

Select one:

- a. $\frac{-4}{x+2} + \frac{1}{x-1} + \frac{2}{(x-1)^2}$
- b. $\frac{-4}{x+2} + \frac{1}{x-1} - \frac{2}{(x-1)^2}$
- c. $\frac{-4}{x+2} + \frac{2}{x-1} - \frac{2}{(x-1)^2}$
- d. $\frac{4}{x+2} + \frac{1}{x-1} - \frac{2}{(x-1)^2}$

Question 18Not yet
answeredPoints out of
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question

Solve the system using Gaussian elimination or Gauss-Jordan elimination.

$$2(x - 2z) = 3y + x + 30$$

$$x = 2y - 2z - 3$$

$$-5x + 2y + 6z = -41$$

Select one:

- a. $\{-1, 3, 5\}$
- b. $\{-3, 1, -5\}$
- c. $\{1, -3, -5\}$
- d. $\{3, -1, 5\}$

Question 19

Not yet
answeredPoints out of
8.75Flag
question**Solve the system using Gaussian elimination or Gauss-Jordan elimination.**

$$3x + 2y + 7z = 38$$

$$9x + 6y + 21z = 114$$

$$0.6x + 0.4y + 1.4z = 7.6$$

Select one:

- a. $\{(x, y, z) \mid 3x + 2y + 7z = 38\}$
- b. $\{(-1, -4, 7)\}$
- c. $\{(1, 4, -7)\}$
- d. $\{\}$

Question 20

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question**For the given augmented matrix, determine the number of solutions to the corresponding system of equations.**

$$\left[\begin{array}{ccc|c} 1 & 0 & 7 & -2 \\ 0 & 1 & -8 & 1 \\ 0 & 0 & 0 & 0 \end{array} \right]$$

Select one:

- a. One solution
- b. Infinitely many solutions
- c. No solution