MTH111 College Algebra Unit 5 Assessment Test Bank

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| --- | --- | --- | --- | --- | --- |
| 1 | Would need to see the students work  Solving Systems of Equations  6 pts | 2 | Would need to see the students work  Systems of Equations as Augmented Matrices  6 pts | 3 | Would need to see the students work  Matrix Algebra  6 pts |
| 4 | Could be turned into an online short answer  Systems of Equations as Augmented Matrices  Solving Systems of Equations  12 pts | 5 | Would need to see the students work  Recognize when and how to proficiently apply algebra tools to solve problems in business, science, and subsequent mathematics courses  6 pts | 6 | Would need to see the students work  Recognize and identify different types of functions (linear, polynomial, radical, inverse, rational, exponential and logarithmic) by making connections between the graphical behavior, numerical patterns and symbolic representations  12 pts |
| 7 | Would need to see the students work  Recognize and identify different types of functions (linear, polynomial, radical, inverse, rational, exponential and logarithmic) by making connections between the graphical behavior, numerical patterns and symbolic representations  8 pts | 8 | Could be turned into an online short answer  Interpret and communicate the concept of a function.  6 pts | 9 | Multiple Choice  Recognize and identify different types of functions (linear, polynomial, radical, inverse, rational, exponential and logarithmic) by making connections between the graphical behavior, numerical patterns and symbolic representations  3 pts |
| 10 | Multiple Choice  Interpret and communicate the concept of a function.  3 pts | 11 | Multiple Choice  Interpret and communicate the concept of a function.  3 pts | 12 | Multiple Choice  Interpret and communicate the concept of a function.  3 pts |
| 13 | Multiple Choice  Recognize and identify different types of functions (linear, polynomial, radical, inverse, rational, exponential and logarithmic) by making connections between the graphical behavior, numerical patterns and symbolic representations  3 pts | 14 | Multiple Choice  Recognize and identify different types of functions (linear, polynomial, radical, inverse, rational, exponential and logarithmic) by making connections between the graphical behavior, numerical patterns and symbolic representations  3 pts | 15 | Multiple Choice  Recognize when and how to proficiently apply algebra tools to solve problems in business, science, and subsequent mathematics courses  3 pts |
| 16 | Multiple Choice  Recognize and identify different types of functions (linear, polynomial, radical, inverse, rational, exponential and logarithmic) by making connections between the graphical behavior, numerical patterns and symbolic representations  3 pts | 17 | Multiple Choice  Recognize and identify different types of functions (linear, polynomial, radical, inverse, rational, exponential and logarithmic) by making connections between the graphical behavior, numerical patterns and symbolic representations  3 pts | 18 | Multiple Choice  Recognize and identify different types of functions (linear, polynomial, radical, inverse, rational, exponential and logarithmic) by making connections between the graphical behavior, numerical patterns and symbolic representations  3 pts |
| 19 | Multiple Choice  Recognize and identify different types of functions (linear, polynomial, radical, inverse, rational, exponential and logarithmic) by making connections between the graphical behavior, numerical patterns and symbolic representations  3 pts | 20 | Multiple Choice  Apply algebra skills to solve equations including linear, polynomial, radical, rational, exponential, and logarithmic expressions, and also linear systems of equations.  3 pts | 21 | Multiple Choice  Recognize and identify different types of functions (linear, polynomial, radical, inverse, rational, exponential and logarithmic) by making connections between the graphical behavior, numerical patterns and symbolic representations  3 pts |
| 22 | Multiple Choice  Apply algebra skills to solve equations including linear, polynomial, radical, rational, exponential, and logarithmic expressions, and also linear systems of equations.  3 pts | 23 | Multiple Choice  Apply algebra skills to solve equations including linear, polynomial, radical, rational, exponential, and logarithmic expressions, and also linear systems of equations.  3 pts | 24 | Multiple Choice  Apply algebra skills to solve equations including linear, polynomial, radical, rational, exponential, and logarithmic expressions, and also linear systems of equations.  3 pts |
| 25 | Multiple Choice  Recognize and identify different types of functions (linear, polynomial, radical, inverse, rational, exponential and logarithmic) by making connections between the graphical behavior, numerical patterns and symbolic representations  3 pts | 26 | Multiple Choice  Recognize and identify different types of functions (linear, polynomial, radical, inverse, rational, exponential and logarithmic) by making connections between the graphical behavior, numerical patterns and symbolic representations  3 pts | 27 | Multiple Choice  Recognize when and how to proficiently apply algebra tools to solve problems in business, science, and subsequent mathematics courses  3 pts |

1. Solve the system of equations by hand, using either substitution or elimination. Show your work.

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2. Translate the system of equations into matrix form. You DO NOT need to solve the system.

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3. Use the given matrices to perform the following operations. If an operation cannot be performed, say so. Feel free to use your calculator.

a) AB= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ b) 2B +C = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ c) BC = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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a) AB= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ b) B +2C = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ c) BC = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Solve the following systems of equations, you **may use your calculator** for these. If a system has no solution, say so. If a system has infinitely many solutions, be sure to describe the solution set.

(a)

(b)

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(a)

(b)

5. Set up a system of equations for the following situations. **You do not need to solve the system, just set it up!**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Calcium | Iron | Vitamin A |
| Food A | 30 | 10 | 10 |
| Food B | 10 | 10 | 30 |
| Food C | 20 | 20 | 20 |
| Total | 310 | 190 | 250 |

A nutritionist in a hospital is arranging a special diet that consists of a combination of three types of food. The patient on the diet must consume exactly: 310 units of calcium, 190 units of iron and 250 units of vitamin A.   
The amount in one ounce of each type of food for each nutrient is given in the table. How many ounces of each food must be used to meet the nutrition requirement?

a) What are the variables? (Hint, there should be 3 of them)

b) Write out the system (do not solve).

5. Set up a system of equations for the following situations. **You do not need to solve the system, just set it up!**

Three different types of candy that cost $2, $3 and $4 per pound are to be mixed to produce a 5 pound bag of candy that costs $14.50. If there are to be equal amounts of the $3-per-pound candy and the $4-per-pound candy, how much of each type of candy should be included in the mixture?

a) What are the variables? (Hint, there should be 3 of them)

b) Write out the system (do not solve).

|  |  |
| --- | --- |
| 6. Write the equations for the given functions.  a)  b)  c) |  |

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| --- | --- |
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|  |  |
| --- | --- |
| 7. Write the equations for the given functions.  a)  b) |  |

|  |  |
| --- | --- |
| 7. Write the equations for the given functions.  a)  b) |  |

|  |  |
| --- | --- |
| 8. Use the given graph to estimate:   1. The interval where the graph is increasing 2. The point where the graph reaches its minimum. 3. The interval where the graph is concave up.   d) Is this function one to one? |  |

|  |  |
| --- | --- |
| 8. Use the given graph to estimate:   1. The interval where the graph is decreasing 2. The point where the graph reaches its minimum. 3. The interval where the graph is concave up.   d) Is this function one to one? |  |

9. Find the average rate of change for the function on the interval

(a) (b) (c) (d) (e) None of these d

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(a) (b) (c) (d) (e) None of these c

10. Given , find ).

(a) (b) (c) (d) (e) None c

10. Given , find ).

(a) (b) (c) (d) (e) None d

11. Given, find so that.

(a) (b) (c) (d) (e) None a

11. Given, find so that.

(a) (b) (c) (d) (e) None b

12. Given, evaluate.

(a) (b) (c) (d) (e) None c

12. Given, evaluate.

(a) (b) (c) (d) (e) None a

13. Find the vertical intercept of the line that passes through the points and .

(a) (b) (c) (d) (e) None d

13. Find the vertical intercept of the line that passes through the points and .

(a) (b) (c) (d) (e) None b

14. Find the slope of any line that is perpendicular to the line: .

(a) (b) (c) (d) (e) None d

14. Find the slope of any line that is perpendicular to the line: .

(a) (b) (c) (d) (e) None c

15. A function for the daily profit, in dollars, of a small bakery is given as where is the number of loaves of bread sold that day. The slope of the profit function means that:

(a) The bakery will make 35₵ a day (b) The breads sells for 35₵ a loaf

(c) The bakery makes a profit of 35₵ per loaf. (d) None of these. c

15. A function for the daily profit, in dollars, of a small coffee shop is given as where is the number of cups of coffee sold that day. The slope of the profit function means that:

(a) The shop will make a profit of47₵ a day (b) The shop makes a profit of 47₵ per cup.

(c) The coffee sells for 47₵ a cup (d) None of these. b

16. Determine the vertex of the quadratic function.

(a) (b) (c) (d) (e) None of these b

16. Determine the vertex of the quadratic function.

(a) (b) (c) (d) (e) None of these d

17. Determine the vertex of the quadratic function:

(a) (b) (c) (d) (e) None of these a

17. Determine the vertex of the quadratic function:

(a) (b) (c) (d) (e) None of these c

18. The vertical asymptote of the rational function is given by the equation:

(a) (b) (c) (d) (e) e

18. The vertical asymptote of the rational function is given by the equation:

(a) (b) (c) (d) (e) d

19. The horizontal asymptote of the rational function is given by the equation:

(a) (b) (c) (d) (e) c

19. The horizontal asymptote of the rational function is given by the equation:

(a) (b) (c) (d) (e) e

20. Which of the following are the solutions to the equation: ?

(a) (b) (c) (d) (e) None a

20. Which of the following are the solutions to the equation: ?

(a) (b) (c) (d) (e) None c

21. Which of the given polynomials would meet the following criteria: as , and as

(a) (b) b

(c) (d) (e) None

21. Which of the given polynomials would meet the following criteria: as , and as

(a) (b) c

(c) (d) (e) None

22. Solve for x in the equation: c

(a) (b) (c) (d) (e) None of these

22. d

Solve for x in the equation:

(a) (b) (c) (d) (e) None of these

23. Solve for x in the equation a

(a) (b) (c) (d) None of these

23. Solve for x in the equation c

(a) (b) (c) (d) None of these

24. Solve for x in the equation: b

(a) (b) (c) (d) None of these

24. Solve for x in the equation: a

(a) (b) (c) (d) None of these

25. Which interval best describes the domain of the function:?

1. (b) (c) (d) (e) None of these a

25. Which interval best describes the domain of the function:?

1. (b) (c) (d) (e) None of these a

26. Which interval best describes the range of the function: ? a

1. (b) (c) (d) (e) None of these

26. Which interval best describes the range of the function: ? c

(a) (b) (c) (d) (e) None of these

27. The vole population is growing on your 2 acre mini-farm. In January, there were 200 voles. But, ten months later there were 3000 voles. Yipes! The vole population can be modeled by . Use the model to determine the growth rate: .

(a) 1.5 (b) 1.311 (c) 0.347 (d) 0.667 (e) None of these b

27. There is a 32 ounce box of chocolate in the break room at 10 in the morning. 2 hours later there are 6 ounces remaining. Assuming an exponential decay model, what is the half-life of the chocolate?

(a) 1 hour (b) .6 hours (c) .8 hours (d) 1.2 hours (e) None of these c