

Print Name \_\_\_\_\_

**MULTIPLE CHOICE.** Choose the one alternative that best completes the statement or answers the question. Write your answer in the blank provided and record your answer on the scantron answer sheet. (You will not be getting the scantron answer sheet back.) If a question appears to not have instructions, the instructions for the previous question apply. A specific method of solving an equation may be given but you can use any method you choose. Good luck and have fun!

Solve the exponential equation. Round to three decimal places when necessary.

1)  $e^x - 5e^{-x} = 4$

1) \_\_\_\_\_

A) 1.733

B) 1.486

C) 1.609

D) 1.622

Solve using the substitution method. Use a graphing calculator to check your answer.

2)  $x + 3y = -20$   
 $x = y - 8$

2) \_\_\_\_\_

A) (-11, -3)

B) (14, 2)

C) No solution

D) Infinitely many solutions

**Solve using the elimination method. Use a graphing calculator to check your answer.**

$$\begin{aligned} 3) \quad & 7x - 7y = 112 \\ & -5x - 4y = -17 \end{aligned}$$

3) \_\_\_\_\_

- A) (9, -6)
- B) (9, -7)
- C) (8, -6)
- D) No solution

**Solve.**

4) Sue wants to plan a meal with 68 grams of fat and 1240 calories. If hot dogs have 13 grams of fat and 145 calories each and if baked beans have 8 grams of fat and 330 calories per half-cup serving, how many hot dogs and servings of beans should she use?

4) \_\_\_\_\_

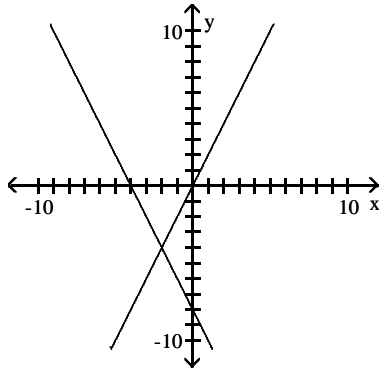
- A) 2 hot dogs and 4 half-cup servings of baked beans
- B) 13 hot dogs and 8 half-cup servings of baked beans
- C) 8 hot dogs and 13 half-cup servings of baked beans
- D) 4 hot dogs and 2 half-cup servings of baked beans

**Find the graph that matches the given system of equations.**

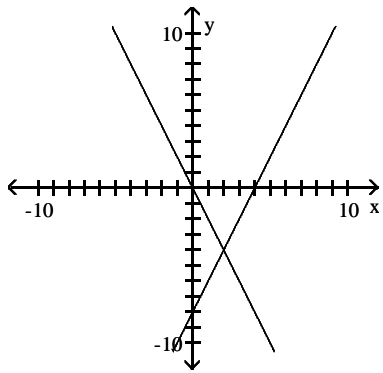
5)  $2x + y = 8$   
 $y = 2x + 0$

5) \_\_\_\_\_

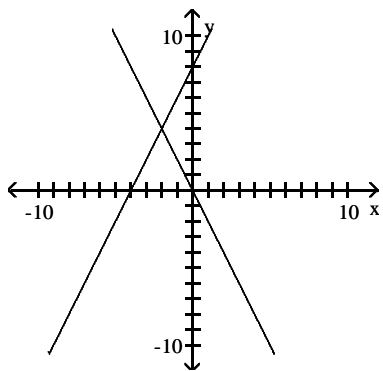
A)



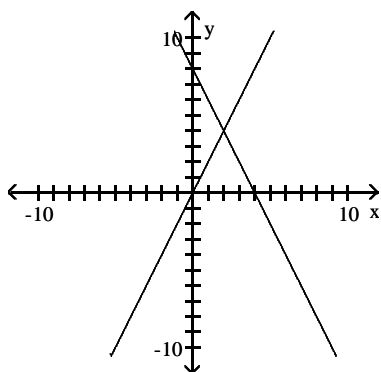
B)



C)



D)



**Solve.**

- 6) A mother is choosing which baby foods to serve her infant. A jar of meat has 2 g of protein and 32 calories. A jar of vegetables has 1 g of protein and 16 calories. How much of each will she need to serve to get 6 g of protein and 114 calories? 6) \_\_\_\_\_
- A) There is no such combination.
- B) 2 jars of meat and 1.5 jars of vegetables
- C) There are infinitely many such combinations.
- D) 1.5 jars of meat and 2 jars of vegetables

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

**Provide an appropriate response.**

- 7) When using the substitution or elimination method to solve a system of two equations, you end up with an equation stating  $0 = 7$ . What does this indicate to you about the system of equations? 7) \_\_\_\_\_

**MULTIPLE CHOICE.** Choose the one alternative that best completes the statement or answers the question. Write your answer in the blank provided and record your answer on the scantron answer sheet. (You will not be getting the scantron answer sheet back.) If a question appears to not have instructions, the instructions for the previous question apply. A specific method of solving an equation may be given but you can use any method you choose. Good luck and have fun!

Solve the system of equations using Gaussian elimination or Gauss–Jordan elimination.

$$\begin{aligned} 8) \quad & 8x + 9y = 32 \\ & -4x + 6y = -16 \end{aligned}$$

8) \_\_\_\_\_

- A) (3, 1)
- B) (4, 0)
- C) (4, 1)
- D) No solution

Determine the order of the matrix.

$$9) \begin{bmatrix} 3 & -6 & 9 & 7 \end{bmatrix}$$

9) \_\_\_\_\_

- A) 1
- B)  $4 \times 1$
- C)  $1 \times 4$
- D) 4

Use Gaussian elimination or Gauss–Jordan elimination to solve the problem.

10) Ellen wishes to mix candy worth \$3.35 per pound with candy worth \$8.38 per pound to form 23 pounds of a mixture worth \$7.07 per pound. How many pounds of the more expensive candy should she use?

10) \_\_\_\_\_

A) 22 lb

B) 6 lb

C) 17 lb

D) 8 lb

Determine the order of the matrix.

11) 
$$\begin{bmatrix} 2 & 0 & 4 \\ -2 & 6 & -6 \\ 0 & 9 & -4 \end{bmatrix}$$

11) \_\_\_\_\_

A) 9

B)  $6 \times 6$

C)  $2 \times 3$

D)  $3 \times 3$

**Solve the exponential equation.**

12)  $4^x = 15$

12) \_\_\_\_\_

A) 1.322

B) 1.953

C) 0.512

D) 3.750

**Solve the logarithmic equation.**

13)  $\log x = -2$

13) \_\_\_\_\_

A) -0.2

B) -20

C) -2

D) 0.01

Solve the exponential equation. Round to three decimal places when necessary.

14)  $e^{-0.09t} = 0.18$

14) \_\_\_\_\_

A) -14.164

B) -25.584

C) 12.673

D) 19.053

Solve the logarithmic equation.

15)  $\log_6 x = -5$

15) \_\_\_\_\_

A)  $\frac{1}{7776}$

B)  $\frac{1}{15,625}$

C) 15,625

D) 7776

**SHORT ANSWER.** Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

16) Find  $f(f^{-1}(1598))$  given that  $f(x) = \sqrt[5]{\frac{6x-2}{5x-3}}$ .

16) \_\_\_\_\_



**MULTIPLE CHOICE.** Choose the one alternative that best completes the statement or answers the question. Write your answer in the blank provided and record your answer on the scantron answer sheet. (You will not be getting the scantron answer sheet back.) If a question appears to not have instructions, the instructions for the previous question apply. A specific method of solving an equation may be given but you can use any method you choose. Good luck and have fun!

**Solve.**

17) In a town whose population is 3000, a disease creates an epidemic. The number  $N$  of people infected  $t$  days after the disease has begun is given by the function  $N(t) = \frac{3000}{1 + 18.3e^{-0.6t}}$ . Find the number infected after 12 days. 17) \_\_\_\_\_

A) 2963

B) 2962

C) 2960

D) 2958

18) Suppose that \$4000 is invested at an interest rate of 5.7% per year, compounded continuously. What is the balance after 10 years? 18) \_\_\_\_\_

A) \$7173.07

B) \$7073.07

C) \$6280.00

D) \$4228.00

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

**Provide an appropriate response.**

19) Explain why  $\log_2 13$  is between 3 and 4.

19) \_\_\_\_\_

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. Write your answer in the blank provided and record your answer on the scantron answer sheet. (You will not be getting the scantron answer sheet back.) If a question appears to not have instructions, the instructions for the previous question apply. A specific method of solving an equation may be given but you can use any method you choose. Good luck and have fun!**

**Solve.**

20) A lake is stocked with 687 fish of a new variety. The size of the lake, the availability of food, and the number of other fish restrict growth in the lake to a limiting value of 4293. The population of fish in the lake after time  $t$ , in months, is given by the function  $P(t) = \frac{4293}{1 + 5.6e^{-0.27t}}$ . Find the population after 20 month(s).

20) \_\_\_\_\_

A) 4197

B) 4187

C) 4177

D) 4202

## Answer Key

Testname: 131\_GRPREVASS\_55\_63

- 1) C  
Objective: (5.5) Solve Exponential Equation II
- 2) A  
Objective: (6.1) Solve System of Equations Using Substitution
- 3) B  
Objective: (6.1) Solve System of Equations Using Elimination
- 4) D  
Objective: (6.1) Solve Apps: Systems of Equations: Miscellaneous
- 5) D  
Objective: (6.1) Match System of Equations with Graph
- 6) A  
Objective: (6.1) Solve Apps: Systems of Equations: Miscellaneous
- 7) The system is inconsistent.  
Objective: (6.3) \*Know Concepts: Matrices and Systems of Equations
- 8) B  
Objective: (6.3) Solve Two-Variable System Using Elimination
- 9) C  
Objective: (6.3) Determine the Order of a Matrix
- 10) C  
Objective: (6.3) Solve Apps: Matrices and Systems of Equations
- 11) D  
Objective: (6.3) Determine the Order of a Matrix
- 12) B  
Objective: (5.5) Solve Exponential Equation I
- 13) D  
Objective: (5.5) Solve Logarithmic Equation I
- 14) D  
Objective: (5.5) Solve Exponential Equation II
- 15) A  
Objective: (5.5) Solve Logarithmic Equation I
- 16) 1598  
Objective: (5.6) \*Know Concepts: Exponential and Logarithmic Functions II
- 17) C  
Objective: (5.6) Solve Apps: Models of Limited Growth
- 18) B  
Objective: (5.6) Solve Apps: Compound Interest
- 19)  $\log_2 8 = 3$  and  $\log_2 16 = 4$ . Since  $8 < 13 < 16$ , then  $3 < \log_2 13 < 4$ . This is true because  $\log_2 x$  is an increasing function.  
Objective: (5.6) \*Know Concepts: Exponential and Logarithmic Functions I
- 20) B  
Objective: (5.6) Solve Apps: Models of Limited Growth