

This exam is closed book. No graphing calculators are allowed. No bathroom breaks are permitted while taking the exam. No cell phones are permitted. There are 15 questions, each is weighted equally. Good luck!

- 1) What is the maximum number of x intercepts that a polynomial of degree 7 can have? 1) _____
A) 8 B) 7
C) 6 D) Not enough information is given.

- 2) Find the equation of any horizontal asymptote: $f(x) = \frac{4x^2 - 2x - 4}{5x^2 - 7x + 8}$ 2) _____
A) $y = 0$ B) $y = \frac{4}{5}$ C) $y = \frac{2}{7}$ D) None

- 3) Find the equations of any vertical asymptotes: $f(x) = \frac{x^2 + 3x}{x^2 - 5x - 24}$ 3) _____
A) $x = 8, x = -3$ B) $x = 8$ C) $x = -8, x = 3$ D) None

- 4) Solve for t: $e^{-0.07t} = 0.05$ Round your answer to four decimal places. 4) _____
A) 42.7962 B) 44.321 C) -66.4815 D) -70.1312

- 5) An initial investment of \$12,000 is invested for 2 years in an account that earns 4% interest, compounded quarterly. Find the amount of money in the account at the end of the period. 5) _____
A) \$12,979.20 B) \$12,994.28 C) \$12,865.62 D) \$994.28

- 6) Conver to an exponential equation: $\log_9 27 = \frac{3}{2}$ 6) _____
A) $27 = \left(\frac{3}{2}\right)^9$ B) $\frac{3}{2} = \sqrt[9]{27}$ C) $9 = 27^{3/2}$ D) $27 = 9^{3/2}$

- 7) Use the properties of logarithms to solve: $\ln(3x - 4) = \ln 20 - \ln(x - 5)$ 7) _____
A) $0, \frac{19}{3}$ B) $-5, -\frac{19}{3}$ C) $\frac{19}{3}$ D) $5, \frac{5}{3}$

- 8) A country has a population growth rate of 2.4% compounded continuously. At this rate, how long will it take for the population of the country to double? Round your answer to the nearest tenth. 8) _____
A) 28.9 years B) .29 years C) 30 years D) 2.9 years

9) The matrix is the final matrix form for a system of two linear equations in variables x_1 and x_2 .

9) _____

Write the Solution of the system: $\begin{bmatrix} 1 & -4 & | & 10 \\ 0 & 0 & | & 0 \end{bmatrix}$

A) $x_1 = t - 4$

$x_2 = t$ for any real number t

C) $x_1 = 4t + 10$

$x_2 = t$ for any real number t

B) No solution

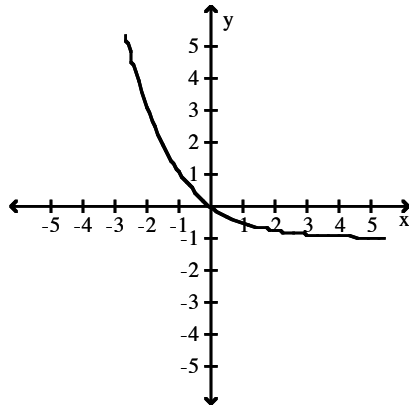
D) $x_1 = t$ for any real number t

$x_2 = 10$

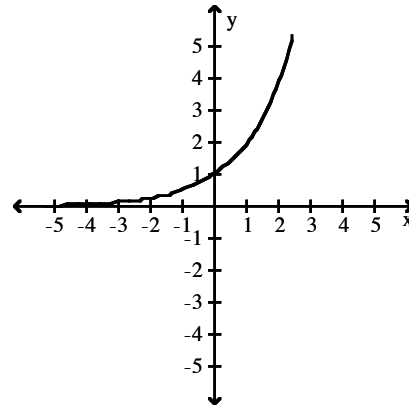
10) Graph the function: $f(x) = 2^{-x} - 1$

10) _____

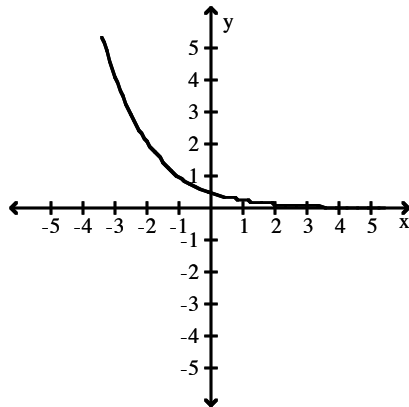
A)



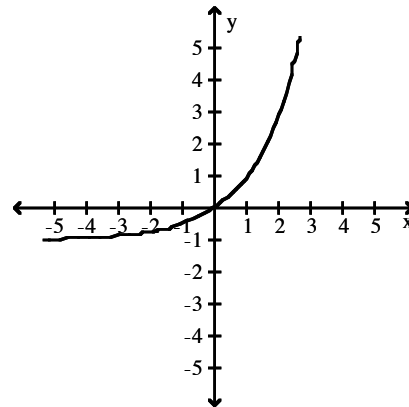
B)



C)



D)



11) Write a system of equations associated with the augmented matrix below. Do not try to solve.

11) _____

$$\left[\begin{array}{ccc|c} 3 & 3 & 5 & -2 \\ 5 & 0 & 7 & 4 \\ 3 & 6 & 0 & 2 \end{array} \right]$$

A) $3x_1 + 3x_2 + 5x_3 = -2$

$5x_1 + 7x_3 = -4$

$3x_1 + 6x_2 = -2$

C) $3x_1 + 3x_2 + 5x_3 = 2$

$5x_1 + 7x_3 = 4$

$3x_1 + 6x_2 = 2$

B) $3x_1 - 3x_2 + 5x_3 = -2$

$5x_1 + 7x_3 = 4$

$3x_1 + 6x_2 = 2$

D) $3x_1 + 3x_2 + 5x_3 = -2$

$5x_1 + 7x_3 = 4$

$3x_1 + 6x_2 = 2$

12) Perform the operation, if possible: Let $A = \begin{bmatrix} -1 & 5 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} -6 & -2 & 9 \\ -5 & -7 & -3 \\ 6 & -8 & 2 \end{bmatrix}$. Find AB . 12) _____

A) $\begin{bmatrix} -13 & -41 & -22 \end{bmatrix}$

B) $\begin{bmatrix} 13 & 41 & 22 \end{bmatrix}$

C) $\begin{bmatrix} 6 & -10 & 9 \\ 5 & -35 & -3 \\ -6 & -40 & 2 \end{bmatrix}$

D) $\begin{bmatrix} -13 \\ -41 \\ -22 \end{bmatrix}$

13) Find the inverse, if it exists, of the given matrix: $\begin{bmatrix} 5 & 8 \\ 3 & 5 \end{bmatrix}$ 13) _____

A) $\begin{bmatrix} -5 & -8 \\ -3 & -5 \end{bmatrix}$

B) $\begin{bmatrix} -5 & 3 \\ 8 & -5 \end{bmatrix}$

C) $\begin{bmatrix} 5 & 3 \\ 8 & 5 \end{bmatrix}$

D) $\begin{bmatrix} 5 & -8 \\ -3 & 5 \end{bmatrix}$

14) Which of the following matrices has an inverse? 14) _____

A) $\begin{bmatrix} -2 & 3 \\ 4 & 1 \end{bmatrix}$

B) $\begin{bmatrix} 0 & -1 \\ 3 & 5 \\ -1 & 3 \end{bmatrix}$

C) $\begin{bmatrix} 0 & 4 \\ 0 & -2 \end{bmatrix}$

D) $\begin{bmatrix} 3 & -2 & 1 \\ 4 & 0 & 7 \end{bmatrix}$

15) Solve the system as matrix equations using inverses: $-5x_1 + 3x_2 = 8$ 15) _____
 $3x_1 - 6x_2 = -30$

A) $(-6, -2)$

B) $(6, 2)$

C) $(-2, -6)$

D) $(2, 6)$

Answer Key

Testname: ECON3410_MIDTERM2

- 1) B
- 2) B
- 3) B
- 4) A
- 5) B
- 6) D
- 7) C
- 8) A
- 9) C
- 10) A
- 11) D
- 12) A
- 13) D
- 14) A
- 15) D