Math 1050 Exam 2 Name_____

Give the equation of the specified asymptote(s).

1) Vertical asymptote(s): $f(x) = \dfrac{3x - 7}{x^2 - 5x - 14}$

A) $x = -7, x = 2$

B) $x = \dfrac{7}{3}, x = 7, x = -2$

C) $x = 7, x = -2$

D) no vertical asymptotes

2) Oblique asymptote: $f(x) = \dfrac{2x^3 + 11x^2 + 5x - 1}{x^2 + 6x + 5}$.

A) $y = 0$ B) $y = 2x - 1$ C) $y = 2x$ D) $y = 2x + 1$

3) Horizontal asymptote: $h(x) = \dfrac{3x^2 - 9x - 9}{7x^2 - 8x + 2}$

A) $y = 0$

B) $y = \dfrac{9}{8}$

C) $y = \dfrac{3}{7}$

D) no horizontal asymptotes

Solve the inequality.

4) $(a + 5)(a + 2)(a - 5) > 0$

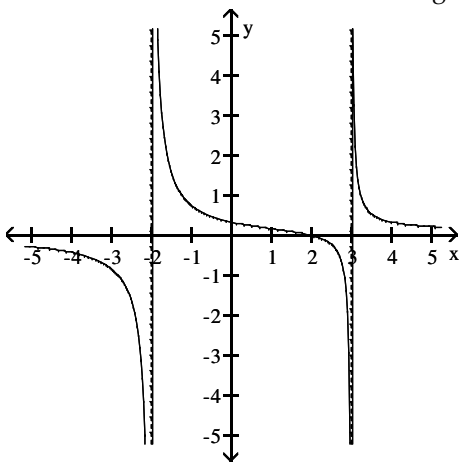
A) $(-\infty, -2)$ B) $(5, \infty)$ C) $(-5, -2)$ or $(5, \infty)$ D) $(-\infty, -5)$ or $(-2, 5)$

Solve the problem.

5) The owner of a video store has determined that the cost C, in dollars, of operating the store is approximately given by $C(x) = 2x^2 - 24x + 600$, where x is the number of videos rented daily. Find the lowest cost to the nearest dollar.

A) \$456 B) \$312 C) \$528 D) \$672

6) Decide which of the rational functions might have the given graph.



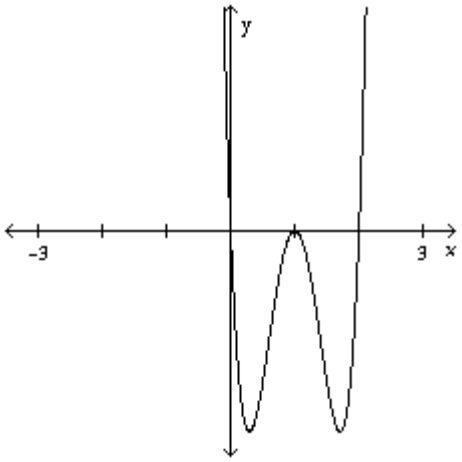
A) $R(x) = \dfrac{x - 2}{(x + 2)(x - 3)}$

B) $R(x) = \dfrac{x + 2}{(x - 2)(x + 3)}$

C) $R(x) = \dfrac{2 - x}{(x + 2)(x - 3)}$

D) $R(x) = \dfrac{x - 2}{(x + 2)^2(x - 3)^2}$

7) Which of the following polynomial functions might have the graph shown in the illustration below?



A) $f(x) = x(x - 2)^2(x - 1)$

B) $f(x) = x(x - 2)(x - 1)^2$

C) $f(x) = x^2(x - 2)^2(x - 1)^2$

D) $f(x) = x^2(x - 2)(x - 1)$

Find the indicated intercept(s) of the graph of the function.

8) x–intercepts of $f(x) = \dfrac{x^2 + 6x}{x^2 + 3x - 6}$

Form a polynomial f(x) with real coefficients having the given degree and zeros.

9) Degree: 3; zeros: –2 and 3 + i.

Solve the equation in the real number system.

10) $x^4 - 3x^3 + 5x^2 - x - 10 = 0$

Use the given zero to find the remaining zeros of the function.

11) $f(x) = x^4 - 5x^2 - 36$; zero: –2i

Use the intermediate value theorem to determine whether the polynomial function has a zero in the given interval.

12) $f(x) = 10x^3 - 7x - 5$; [1, 2]

Solve the inequality.

13) $\frac{x + 17}{x + 1} < 5$

14) Find a 3rd degree polynomial with real zeros including 0, 3 and –4

Math 1050 Test 3

1. For the given functions: $f(x)=\frac{1}{x}$ and $g(x)=\frac{x+1}{x-3}$

a) Find $(f\circ g)(x)$ and simplify your answer.

b) Find the domain of $(f\circ g)(x)$. Please give your answer using interval notation.

2. The function f is one-to-one. Find its inverse, f^{-1}. State the domain and range of f and f^{-1}.

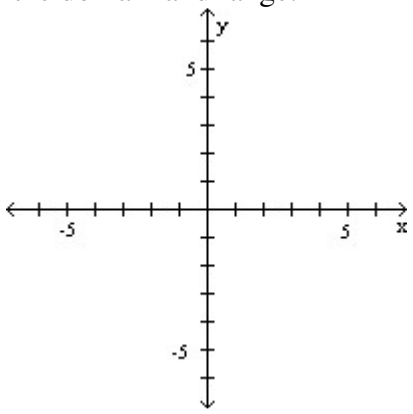
$f(x)=\frac{5}{x+2}$ $\qquad$ $f^{-1}(x)=$ _____

Domain of f: _____ $\qquad$ Domain of f^{-1}: _____

Range of f: _____ $\qquad$ Range of f^{-1}: _____

3. Suppose $f(x) = 2^{x+1} - 3$

a) Sketch f(x) using transformations. Sketch and **label the asymptote and the y-intercept**. State the domain and range.



Domain of f: _____ Range of f: _____

b) Determine graphically whether this function is one-to-one. Explain how you made your determination.

Is f one-to-one (yes or no) :_____

Explain :

4) Solve the equation $\log_2(x+7) + \log_2(x+8) = 1$.

5) Find the principal needed now to get $7500 after 8 years at 2% compounded quarterly.

6) A colony of bacteria increases exponentially (obeys the law of uninhibited growth). If 10,000 bacteria are present initially and there are 17,000 after one hour,

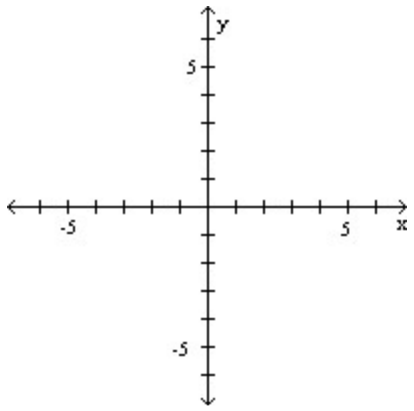
a) What is the growth rate of the bacteria? Please give the exact value **and** an approximation to three decimal places.

Exact value:_____ Approximation:_____

b) How many will be present after five hours?

7)

Graph the function $f(x)=\log_4(x+2)$ by hand. **Label the x intercept and at least one other point on the graph and give the equation of the asymptote.**



8) Solve the equation $3^{x-5}=4^x$ by giving both an exact value and a decimal approximation to three decimal places.

Exact Solution:_____ Decimal Approximation:_____

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Exam 4 A

You must show enough to support your answers so that I know you understand the material.
If the question asks you to use a certain method, then you must use that method or you will not receive any credit.
Unsupported answers will receive very little or no credit.

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Solve the problem.

1) An arch in the form of a semiellipse is 52 ft wide at the base and has a height of 20 ft. How wide is the arch at a height of 11 ft above the base? Aproximate your answer to the nearest tenth. 1) _____

Find an equation for the hyperbola described.

2) center at (8, 1); focus at (4, 1); vertex at (7, 1) 2) _____

Name: _____

Write the augmented matrix for the system.

3) $\begin{cases} 5x + 20y = 62 \\ 2x + 2y = 8 \end{cases}$ 3) _____

Solve the system of equations **using Gaussian Elimination in matrix form.**

4) $\begin{cases} 5x + 20y = 62 \\ 2x + 2y = 8 \end{cases}$ 4) _____

Solve the system of equations **using Cramer's Rule**.

5) $\begin{cases} 3x + 6y = 12 \\ 2x + 1y = -1 \end{cases}$ 5) _____

Name: _____

Solve the system **using the inverse matrix method**.

6) $\begin{cases} 6x + 5y = 7 \\ 4x + 1y = -7 \end{cases}$ 6) _____

Solve for x.

7) $\begin{vmatrix} 8 & x \\ 2 & 5 \end{vmatrix} = 32$ 7) _____

Use the given matrices to compute the given expression.

8) If $A = \begin{bmatrix} 2 & -1 \\ 7 & 9 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & -3 \\ 4 & 7 \end{bmatrix}$, find $-2A + 4B$. 8) _____

Name: _____

Perform the indicated operations and simplify.

9) 9) _____

Let $A = \begin{bmatrix} 3 & 4 \\ 1 & 0 \\ 2 & -1 \end{bmatrix}$, $B = \begin{bmatrix} -6 & 1 \\ 0 & 2 \\ -1 & -4 \end{bmatrix}$, and $C = \begin{bmatrix} 4 & 2 & 6 \\ 1 & -3 & 0 \end{bmatrix}$. Find $BC + 5I_3$.

Write the partial fraction decomposition of the rational expression.

10) $\dfrac{4x^2 + 6x - 3}{(x + 2)(x + 1)^2}$ 10) _____

Name: _____

The following augmented matrix is ready to solve. Use back substitution to find the solution.

11) 11) _____

$$\left[\begin{array}{ccc|c} 1 & 3 & 5 & -13 \\ 0 & 4 & 4 & -12 \\ 0 & 0 & 1 & -4 \end{array}\right]$$

Extra Credit: This question is worth 5 points if done correctly andby hand.

12) Determinants are used to show that three points lie on the same line (are collinear). If 12) _____

$$\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} = 0,$$

then the points (x_1, y_1), (x_2, y_2), and (x_3, y_3) are collinear. If the determinant does not equal 0, then the points are not collinear. Are the points (-4, -10), (0, 5), and (-12, -39) collinear?

Math 1050 Exam

Name_____

Find the common ratio for the geometric sequence. If a sequence is not geometric, say so.

1) $\frac{3}{3}, \frac{3}{6}, \frac{3}{12}, \frac{3}{24}, \frac{3}{48}$

A) 9 B) 2 C) $\frac{1}{9}$ D) $\frac{1}{2}$

Find the sum, if it exists, for the infinite geometric sequence.

2) $\sum_{i=1}^{\infty} 2\left(\frac{1}{5}\right)^i$

A) 1 B) 0.4 C) Does not exist D) 0.5

Find the first term and give a formula for the given arithmetic sequence. In other words, find a formula for $\{a_n\}$, the term generator.

3) 8th term is 61; 14th term is 115

A) $a_1 = -11,\ a_n = -11 + 9n$ B) $a_1 = -2,\ a_n = -2 + 9n$

C) $a_1 = -2,\ a_n = -11 + 9n$ D) $a_1 = -2,\ a_n = -11 - 9n$

Use the formula for S_n to find the sum for the geometric sequence.

4) $\sum_{i=1}^{5} 3(-2)^i$

A) 10 B) −66 C) −18 D) −255

Determine whether the given sequence is arithmetic, geometric, or neither. If arithmetic, find the common difference. If geometric, find the common ratio.

5) 2, 7, 12, 17, . . .

Find a general term, a_n.

6) $\frac{1}{1}, \frac{1}{4}, \frac{1}{9}, \frac{1}{16}, \frac{1}{25}$

Use mathematical induction to prove the statement is true for all positive integers n.

7) $6 + 12 + 18 + \ldots + 6n = 3n(n + 1)$

Find the indicated term for the sequence.

8) $a_n = n^2 - n$; a_{15}

Solve the problem.

9) A brick staircase has a total of 25 steps. The bottom step requires 50 bricks. Each successive step requires 2 fewer bricks than the prior step. How many bricks are required to build the staircase?

Write out the first five terms of the sequence.

10) $a_n = \frac{(-1)^{n+1}}{n+1} x^n$

A) $-0.5x, -0.33x^2, -0.25x^3, -0.2x^4, -0.17x^5$

B) $0.5x, 0.33x^2, 0.25x^3, 0.2x^4, 0.17x^5$

C) $0.5x, -0.33x^2, -0.25x^3, -0.2x^4, -0.17x^5$

D) $0.5x, -0.33x^2, 0.25x^3, -0.2x^4, 0.17x^5$