Take Assessment: Exam 3

Name Exam 3
Instructions
Multiple Attempts This Test allows 2 attempts. This is attempt number 1.
Force Completion This Test can be saved and resumed later.

▾ **Question Completion Status:**

Question 1 **5 points** Save

Determine whether the rational function has symmetry with respect to the origin, symmetry with respect to the y-axis, or neither.

$$f(x) = \frac{8x^2 + 4}{4x}$$

- symmetry with respect to the y-axis
- symmetry with respect to the origin
- neither

Question 2 **5 points** Save

Solve.

The power that a resistor must dissipate is jointly proportional to the square of the current flowing through the resistor and the resistance of the resistor. If a resistor needs to dissipate 64 watts of power when 4 amperes of current is flowing through the resistor whose resistance is 4 ohms, find the power that a resistor needs to dissipate when 3 amperes of current are flowing through a resistor whose resistance is 7 ohms.

- 63 watts
- 147 watts
- 84 watts
- 21 watts

Question 3 **5 points** Sav

Give the equation of the oblique asymptote, if any, of the function.

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

- no oblique asymptote
- $y = 0$
- $y = 2x$
- $y = x + 2$

uestion 4

Solve the inequality.

5 points Save

$(x + 1)(x - 3) \leq 0$

- $(-\infty, -1]$
- $[-1, 3]$
- $[3, \infty)$
- $(-\infty, -1]$ or $[3, \infty)$

Question 5

Solve the inequality.

5 points Save

$$\frac{x^2(x - 12)(x + 2)}{(x - 6)(x + 7)} \geq 0$$

- $(-\infty, -7)$ or $[-2, 6)$ or $[12, \infty)$
- $(-\infty, -7)$ or $[12, \infty)$
- $(-7, -2]$ or $(6, 12]$
- $(-\infty, -7)$ or $[-2, 0)$ or $(0, 6)$ or $[12, \infty)$

Question 6

5 points Save

List the potential rational zeros of the polynomial function. Do not find the zeros.

$f(x) = x^5 - 4x^2 + 2x + 14$

- $\pm 1, \pm \frac{1}{7}, \pm \frac{1}{2}, \pm \frac{1}{14}$
- $\pm 1, \pm 7, \pm 2, \pm 14$
- $\pm 1, \pm 7, \pm 2$
- $\pm 1, \pm \frac{1}{7}, \pm \frac{1}{2}, \pm \frac{1}{14}, \pm 7, \pm 2, \pm 14$

Question 7

5 points Save

Determine where the function is increasing and where it is decreasing.

$f(x) = -x^2 - 4x + 5$

- increasing on $(-\infty, 9)$
  decreasing on $(9, \infty)$
- increasing on $(-2, \infty)$
  decreasing on $(-\infty, -2)$
- increasing on $(-\infty, -2)$
  decreasing on $(-2, \infty)$
- increasing on $(9, \infty)$
  decreasing on $(-\infty, 9)$

Question 8

5 points Save

Use the Factor Theorem to determine whether x - c is a factor of f(x).

$8x^3 + 36x^2 - 19x - 5$; $x + 5$

- Yes
- No

Question 9

5 points Save

Use the x-intercepts to find the intervals on which the graph of f is above and below the x-axis.

$f(x) = (x - 5)^3$

- above the x-axis: $(-\infty, 5)$
  below the x-axis: $(5, \infty)$
- above the x-axis: $(-\infty, 5), (5, \infty)$
  below the x-axis: no intervals
- above the x-axis: no intervals
  below the x-axis: $(-\infty, 5), (5, \infty)$
- above the x-axis: $(5, \infty)$
  below the x-axis: $(-\infty, 5)$

Question 10

5 points Save

Solve the problem.

The price p (in dollars) and the quantity x sold of a certain product obey the demand equation
$p = -20x + 480$, $0 \le x \le 24$.
What price should the company charge to maximize revenue?

- $6
- $14.4
- $18
- $12

Question 11

5 points Save

Give the equation of the oblique asymptote, if any, of the function.

$$f(x) = \frac{2x^3 + 11x^2 + 5x - 1}{x^2 + 6x + 5}$$

- $y = 0$
- $y = 2x - 1$
- $y = 2x$
- $y = 2x + 1$

Question 12

5 points Save

Solve the problem.

When the temperature stays the same, the volume of a gas is inversely proportional to the pressure of the gas. If a balloon is filled with 20 cubic inches of a gas at a pressure

of 14 pounds per square inch, find the new pressure of the gas if the volume is decreased to 10 cubic inches.

- 14 pounds per square inch
- $\frac{5}{7}$ pounds per square inch
- 26 pounds per square inch
- 28 pounds per square inch

Question 13 **5 points** Save

Solve the problem.

One solution of $x^3 - 5x^2 + 5x - 1 = 0$ is 1. Find the other two solutions.

- $\{2 + 2\sqrt{3}, 2 - 2\sqrt{3}\}$
- $\{4 + \sqrt{3}, 4 - \sqrt{3}\}$
- $\{2 + \sqrt{3}, 2 - \sqrt{3}\}$
- $\{4 + 2\sqrt{3}, 4 - 2\sqrt{3}\}$

Question 14 **5 points** Save

Solve the inequality.

$x^4 - 32x^2 - 144 > 0$

- $(-\infty, -6)$ or $(6, \infty)$
- $(-\infty, -6)$ or $(-2, 2)$ or $(6, \infty)$
- $(-6, 6)$
- $(-6, -2)$ or $(2, 6)$

Question 15 **5 points** Save

Solve the inequality.

$x^2 - 2x \geq 0$

- $(-\infty, 0]$ or $[2, \infty)$
- $[-2, 0]$
- $(-\infty, -2]$ or $[0, \infty)$
- $[0, 2]$

Question 16 **5 points** Save

Find all of the real zeros of the polynomial function, then use the real zeros to factor f over the real numbers.

$f(x) = 3x^3 - 5x^2 + 12x - 20$

- $-4, -1, \frac{5}{3}$; $f(x) = (3x - 5)(x + 1)(x + 4)$

- 20; $f(x) = (x - 20)(3x^2 + 1)$
- 4, $\frac{5}{3}$, 1; $f(x) = (3x - 5)(x - 1)(x - 4)$
- $\frac{5}{3}$; $f(x) = (3x - 5)(x^2 + 4)$

Question 17

Find all of the real zeros of the polynomial function, then use the real zeros to factor f over the real numbers. 5 points Save

$f(x) = 3x^4 - 6x^3 + 4x^2 - 2x + 1$

- no real roots; $f(x) = (x^2 + 1)(3x^2 + 1)$
- 1, multiplicity 2; $f(x) = (x - 1)^2(3x^2 + 1)$
- -1, 1; $f(x) = (x - 1)(x + 1)(3x^2 + 1)$
- -1, multiplicity 2; $f(x) = (x + 1)^2(3x^2 + 1)$

Question 18 5 points Save

Find the domain of the rational function.

$g(x) = \frac{x + 2}{x^2 - 64}$

- all real numbers
- $\{x|x \neq -8, x \neq 8, x \neq -2\}$
- $\{x|x \neq -8, x \neq 8\}$
- $\{x|x \neq 0, x \neq 64\}$

Question 19 5 points Save

Find the vertical asymptotes of the rational function.

$f(x) = \frac{x - 2}{4x - x^3}$

- $x = 0, x = -2$
- $x = 0, x = 2$
- $x = 0, x = -2, x = 2$
- $x = -2, x = 2$

Question 20 5 points Save

Determine the domain and the range of the function.

$f(x) = x^2 + 10x$

- domain: all real numbers
  range: $\{y|y \geq -25\}$

ıent: Exam 3

- domain: $\{x|x \geq 5\}$
  range: $\{y|y \geq 25\}$
- domain: $\{x|x \geq -5\}$
  range: $\{y|y \geq -25\}$
- domain: all real numbers
  range: $\{y|y \geq 25\}$

Take Assessment: Exam 4

Name Exam 4
Instructions
Multiple Attempts This Test allows 2 attempts. This is attempt number 1.
Force Completion This Test can be saved and resumed later.

Question Completion Status:

Question 1 5 points

The function f is one-to-one. Find its inverse.

$f(x) = (x - 8)^3$

- $f^{-1}(x) = \sqrt[3]{x} + 8$
- $f^{-1}(x) = \sqrt[3]{x} - 8$
- $f^{-1}(x) = \sqrt[3]{x} + 512$
- $f^{-1}(x) = \sqrt{x} + 8$

Question 2 5 points

Solve the equation.

$8 + 4 \ln x = 5$

- $\left\{\frac{-3}{4 \ln 1}\right\}$
- $\left\{\frac{e^{-3}}{4}\right\}$
- $\{e^{-3}\}$
- $\left\{\ln\left(-\frac{3}{4}\right)\right\}$

Question 3 5 poin

Solve the equation.

$\log_3 27 = x$

- {81}
- {9}
- {3}
- {30}

Question 4 — 5 points — Save

Find the effective rate of interest.

50.11% compounded daily

- 50.233%
- 51.015%
- 50.315%
- 64.997%

Question 5 — 5 points — Save

Solve the equation.

$\log_5 (x^2 - 5x) = 1$

- {6}
- {1}
- {6, -1}
- {-6, 1}

Question 6 — 5 points — Save

Find the present value. Round to the nearest cent.

To get $10,000 after 2 years at 18% compounded monthly

- $5000.00
- $6995.44
- $8363.87
- $11,956.18

Question 7 — 5 points — Save

Find the exact value of the logarithmic expression.

ln l

- -1
- 0
- e
- 1

Question 8 — 5 points — Save

Find the value of the expression.

Let $\log_a A = 5$ and $\log_a B = -4$. Find $\log_a B^2$.

- -8
- 10

- 16
- -16

Question 9 5 points Save

Express as a single logarithm.

$(\log_a q - \log_a r) + 4\log_a p$

- $\log_a \frac{4qp}{r}$
- $\log_a \frac{q}{p^4 r}$
- $\log_a \frac{qp^4}{r}$
- $\log_a qp^4 r$

Question 10 5 points Save

Express as a single logarithm.

$3\log_6 x + 5\log_6 (x - 6)$

- $\log_6 x^3 (x - 6)^5$
- $\log_6 x(x - 6)^{15}$
- $\log_6 x(x - 6)$
- $15 \log_6 x(x - 6)$

Question 11 5 points Save

Solve the equation.

$2^{-x} = \frac{1}{16}$

- $\left\{\frac{1}{8}\right\}$
- $\{4\}$
- $\left\{\frac{1}{4}\right\}$
- $\{-4\}$

Question 12 5 points Sav

The function f is one-to-one. Find its inverse.

$f(x) = \frac{4x + 1}{3}$

- $f^{-1}(x) = \frac{3}{4x - 1}$
- $f^{-1}(x) = \frac{3x - 1}{4}$
- $f^{-1}(x) = \frac{3}{4x + 1}$
- $f^{-1}(x) = \frac{3x + 1}{4}$

Question 13 5 points Save

Decide whether the composite functions, f ∘ g and g ∘ f, are equal to x.

$f(x) = \sqrt[5]{x - 13}$, $g(x) = x^5 + 13$

- No, no
- No, yes
- Yes, no
- Yes, yes

Question 14 5 points Save

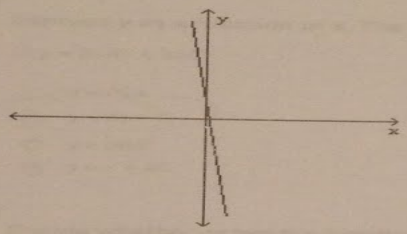
Solve the exponential equation. Express the solution set in terms of natural logarithms.

$4^{x+4} = 5^{2x+5}$

- {7 ln 5 - 5 ln 4}
- $\left\{\frac{5 \ln 5 - 4 \ln 4}{\ln 4 - 2 \ln 5}\right\}$
- $\left\{\ln\left[\frac{5^5}{4^4} - \frac{4}{5^2}\right]\right\}$
- {ln 5 - ln 4}

Question 15 5 points Save

Use the horizontal line test to determine whether the function is one-to-one.



- Yes
- No

Question 16 5 points Save

Solve the equation.

$\frac{1}{3}\log_2(x + 6) = \log_8(3x)$

- {3, 0}
- ∅
- {3}
- {9}

Question 17 5 points Save

Find the indicated composite for the pair of functions.

$(f \circ g)(x)$: $f(x) = 3x + 8$, $g(x) = 3x - 1$

- $9x + 7$
- $9x + 11$
- $9x + 5$
- $9x + 23$

Question 18 5 points Save

Find functions f and g so that the composition of f and g is H.

$H(x) = |4 - 3x^2|$

- $f(x) = x^2$; $g(x) = 4 - 3|x|$
- $f(x) = 4 - 3|x|$; $g(x) = x^2$
- $f(x) = |x|$; $g(x) = 4 - 3x^2$
- $f(x) = 4 - 3x^2$; $g(x) = |x|$

Question 19

5 points

Express y as a function of x. The constant C is a positive number.

$\ln y = \ln 4x + \ln C$

- $y = 4Cx$
- $y = 4x + C$
- $y = (4x)^C$
- $y = x + 4C$

Question 20

5 points

Decide whether or not the functions are inverses of each other.

$f(x) = 5 - 9x$; $g(x) = \frac{x}{9}(x - 5)$

- Yes
- No

Save

Take Assessment: Exam 5

Name Exam 5
Instructions
Multiple Attempts This Test allows 2 attempts. This is attempt number 1.
Force Completion This Test can be saved and resumed later.

Question Completion Status:

Question 1 **5 points** Save

Solve the system using the inverse method.

$$\begin{cases} x + 2y + 3z = -9 \\ x + y + z = -1 \\ x - 2z = 8 \end{cases}$$

- x = -9, y = 0, z = 0
- x = 7, y = -15, z = -1
- x = 6, y = -6, z = -1
- x = -14, y = -16, z = -3

Question 2 **5 points** Save

Use the properties of determinants to find the value of the second determinant, given the value of the first.

$$\begin{vmatrix} x & y & z \\ u & v & w \\ 1 & 3 & 2 \end{vmatrix} = -41 \qquad \begin{vmatrix} 1 & 3 & 2 \\ u & v & w \\ x & y & z \end{vmatrix} = ?$$

- Can't determine
- 41
- 0
- -41

Question 3 **5 points** Sav

Solve the system.

$$\begin{cases} x + 2y = -9 \\ 5x + 10y = -45 \end{cases}$$

- inconsistent (no solution)
- (-9, 0)
- (0, 0)

$y = -\frac{x}{2} - 9$, where x is any real number

Question 4 5 points Save

Use the properties of determinants to find the value of the second determinant, given the value of the first.

Given $\begin{vmatrix} s & t & u \\ v & w & x \\ 4 & 2 & 8 \end{vmatrix} = 3$, find the value of $\begin{vmatrix} 32-s & 16-t & 64-u \\ v & w & x \\ 4 & 2 & 8 \end{vmatrix}$.

- -24
- -3
- 24
- 3

Question 5 5 points Save

Write a system of equations associated with the augmented matrix. Do not solve.

$$\left[\begin{array}{ccc|c} 1 & 0 & 0 & -2 \\ 0 & 1 & 0 & -8 \\ 0 & 0 & 1 & -10 \end{array}\right]$$

- $\begin{cases} x = 2 \\ y = 8 \\ z = 10 \end{cases}$
- $\begin{cases} x = -2 \\ y = -8 \\ z = -10 \end{cases}$
- $\begin{cases} x = 0 \\ y = -10 \\ z = -12 \end{cases}$
- $\begin{cases} x = 8 \\ y = 2 \\ z = 0 \end{cases}$

Question 6 5 points Sav

Use the elimination method to solve the system.

$$\begin{cases} x + y = -5 \\ x - y = 16 \end{cases}$$

- x = 5, y = -10.5
- x = 5.5, y = 10.5
- x = 5, y = 5.5
- x = 5.5, y = -10.5

Question 7 5 points Se

Find the value of the determinant.

$$\begin{vmatrix} 3 & 1 \\ 1 & 2 \end{vmatrix}$$

- 7
- -5
- 1
- 5

Question 8 **5 points** Save

Find the inverse of the matrix.

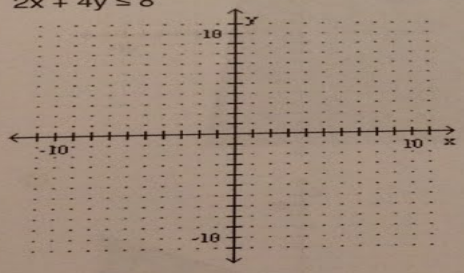
$$\begin{bmatrix} -1 & 6 \\ 0 & -1 \end{bmatrix}$$

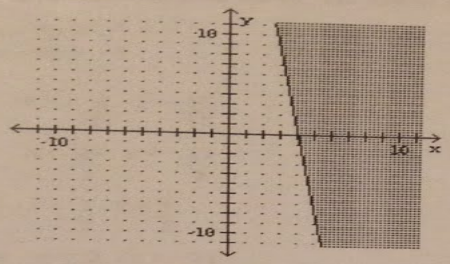
- $\begin{bmatrix} -1 & 6 \\ 0 & -1 \end{bmatrix}$
- $\begin{bmatrix} -1 & 6 \\ 0 & -1 \end{bmatrix}$
- $\begin{bmatrix} -1 & -6 \\ 0 & -1 \end{bmatrix}$
- $\begin{bmatrix} 0 & -1 \\ -1 & -6 \end{bmatrix}$

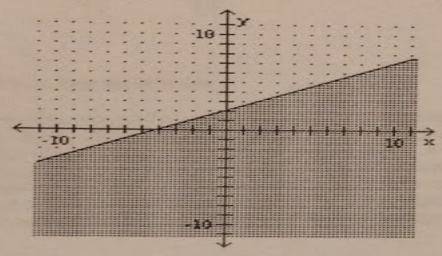
Question 9 **5 points** Sav

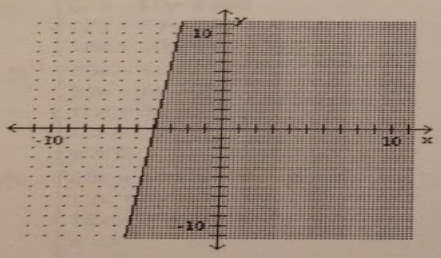
Graph the inequality.

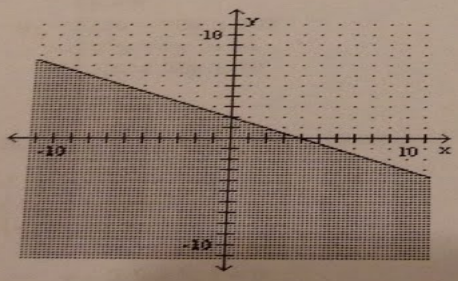
$2x + 4y \leq 8$











Question 10

5 points

Use **Cramer's rule to solve the linear system.**

$$\begin{cases} 4x - 7y = 5 \\ 2x + 5y = -3 \end{cases}$$

- $x = -\frac{2}{17}, y = \frac{11}{17}$
- $x = \frac{23}{3}, y = -\frac{11}{3}$
- $x = \frac{2}{3}, y = \frac{1}{3}$
- $x = \frac{2}{17}, y = -\frac{11}{17}$

Question 11 **5 points** Save

Solve the problem.

The liquid portion of a diet is to provide at least 300 calories, 36 units of vitamin A, and 90 units of vitamin C daily. A cup of dietary drink X provides 60 calories, 12 units of vitamin A, and 10 units of vitamin C. A cup of dietary drink Y provides 60 calories, 6 units of vitamin A, and 30 units of vitamin C. Set up a system of linear inequalities that describes the minimum daily requirements for calories and vitamins. Let x = number of cups of dietary drink X, and y = number of cups of dietary drink Y. Write all the constraints as a system of linear inequalities.

- $\begin{cases} 60x + 60y \le 300 \\ 12x + 6y \le 36 \\ 10x + 30y \le 90 \end{cases}$
- $\begin{cases} 60x + 60y > 300 \\ 12x + 6y > 36 \\ 10x + 30y > 90 \\ x > 0 \\ y > 0 \end{cases}$
- $\begin{cases} 60x + 60y \ge 300 \\ 12x + 6y \ge 36 \\ 10x + 30y \ge 90 \\ x \ge 0 \\ y \ge 0 \end{cases}$
- $\begin{cases} 60x + 60y \ge 300 \\ 12x + 6y > 36 \\ 10x + 30y \ge 90 \end{cases}$

Question 12 **5 points** Save

Solve the system of equations.

$$\begin{cases} x - y + 2z = -3 \\ 4x + z = 0 \\ -x + y - 2z = 6 \end{cases}$$

- $x = 0, y = 3, z = 0$
- inconsistent (no solution)