

MAT-000 Section X Practice Test 1 Z

Name: _____

Give yourself thirty minutes. Do not use your book or notes. You may use a calculator.

1. Find the x -coordinate of the center of the circle $x^2 + 3x + y^2 + 6y = 15$.

2. Find the value of the limit

$$\lim_{x \rightarrow -2} \left[\frac{1}{x+2} + \frac{4}{x^2-4} \right]$$

3. At what value or values of x is the function

$$f(x) = \begin{cases} |x+1| - 1 & \text{if } x < 0 \\ x^2 + x & \text{if } 0 \leq x < 1 \\ 3 - x & \text{if } 1 \leq x \end{cases}$$

discontinuous?

4. Let $f(x) = \sqrt{\sin x + \cos^2 x + 1}$. Find $f'(0)$.

5. Find $\frac{dy}{dx}$.

(a) $x \cos y + y \cos x = 1$

(b) $y = \sqrt[3]{3x^3 - x^2 - 1}$

6. Find the value of the limit

$$\lim_{n \rightarrow \infty} \sum_{i=1}^n \frac{1}{n} \left[\left(\frac{i}{n} \right)^3 + 1 \right].$$

7. Let $f(x) = x^2$ on the interval $[0, 2]$. Let the interval be partitioned as follows: $P = \{0, 1, 2\}$. Find the value of the Riemann sum

$$\sum_{i=1}^n f(x_i^*) \Delta x_i$$

if each x_i is the midpoint of its subinterval.

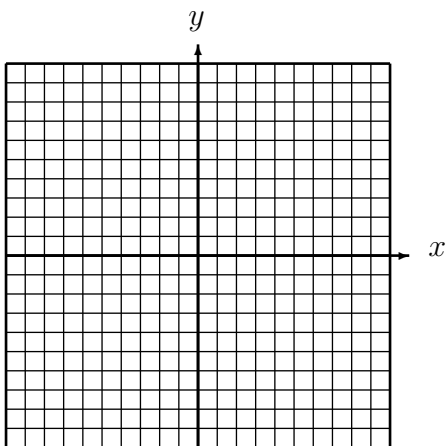
8. Evaluate each of the following

(a) $\int_0^1 te^{-t^2} dt$

(b) $\iint_R \cos\left(\frac{y-x}{y+x}\right) dA$, where R is the trapezoidal region with vertices $(1, 0)$, $(2, 0)$, $(0, 2)$, and $(0, 1)$.

9. Solve $D\mathbf{X} = A\mathbf{X}$, where $A = \begin{bmatrix} 1 & 0 & 4 \\ 0 & 3 & 0 \\ 1 & 0 & 1 \end{bmatrix}$.

10. Graph the equation $3x + 2y + 12 = 6$.



11. Select the view window that shows the most complete graph of the function $f(x) = x^2 + 3x + 20$.

$x\text{Min} = -10$
$x\text{Max} = 10$
$x\text{Scl} = 1$
$y\text{Min} = 10$
$y\text{Max} = 50$
$y\text{Scl} = 1$
$x\text{Res} = 1$

$x\text{Min} = 0$
$x\text{Max} = 20$
$x\text{Scl} = 1$
$y\text{Min} = 10$
$y\text{Max} = 50$
$y\text{Scl} = 1$
$x\text{Res} = 1$

$x\text{Min} = -10$
$x\text{Max} = 10$
$x\text{Scl} = 1$
$y\text{Min} = -20$
$y\text{Max} = 20$
$y\text{Scl} = 1$
$x\text{Res} = 1$