

Name: _____

MA 2310 Test 1

1. Graph the following functions on the same graph $f(x) = 2 - x^2$ and $g(x) = -2x + 3$. Compute the points of intersection (if there are any) for the two functions.

2. Compute the following

(a) $\cos(\pi/4)$

(b) $\cos(\arcsin(3/2))$

3. Compute the following limits (show work).

(a) $\lim_{x \rightarrow 3} \frac{x - 3}{x^2 + 2x - 15}$

(b) $\lim_{x \rightarrow 0} \frac{\cos(x)}{x^2}$

(c) $\lim_{x \rightarrow \infty} \frac{x^3 - x + 1}{1 - x^3}$

(d) $\lim_{x \rightarrow \infty} \frac{x^7 - x + 1}{1 - x^3}$

(e) $\lim_{x \rightarrow \infty} \frac{x^3 - x + 1}{1 - x^7}$

4. Determine if the function can be made continuous at the point x_0 . And if it can find the value c so that the function is continuous at x_0 .

$$f(x) = \begin{cases} \frac{\cos(x)}{x} & : x \neq 0 \\ c & : x = 0 \end{cases} \quad \text{where } x_0 = 0.$$

5. Compute the horizontal and vertical asymptotes.

$$f(x) = \frac{x^2 - 8x + 16}{x^2 - 4}$$

6. Compute the derivative using the Definition for $f(x) = x^3$.

7. Compute the derivatives of the following functions using the rules.

(a) $f(x) = 7 + x - \frac{3}{x} + 2\sqrt{x}$

(b) $f(x) = 4x(2 - 3x)$

(c) $f(x) = 3\sin(x) - 7x$

8. Compute the equation of the tangent line for $f(x) = 2 - x^2$ at the point $x_0 = -1$.