MTH 1125 Test #1

SUMMER 2016

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Instructions. Show CLEARLY how you arrive at your answers.

1. Compute: $\lim_{x\to 2} \frac{3x^2-5x+2}{x^2+2x} =$

2. Compute: $\lim_{x\to -2} \frac{x^2+4x+4}{x^2+5x+6} =$

3. Compute: $\lim_{x\to 3} \frac{x-5}{x^2-2x-3} =$

4. $f(x) = \begin{cases} 2x-2 & \text{for} \quad x<3 \\ 4 & \text{for} \quad x=3 \\ 10-2x & \text{for} \quad x>3 \end{cases}$

   Determine whether or not $f(x)$ is continuous at the point $x = 3$.

5. Find the asymptotes and graph: $f(x) = \frac{x-1}{x^2-x-6}$

6. Compute: $\lim_{x\to 1} \frac{\sqrt{8+x}-3}{x-1} =$

7.

$x =$	$f(x) =$
3.5	10.1
3.9	100.8
3.99	1,000.3
3.999	10,000.3
3.999	100,000.9

$x =$	$f(x) =$
4.5	10.1
4.1	100.8
4.01	1,000.3
4.001	10,000.3
4.0001	100,000.9

Based on the information in the table above, do the following:

(a) compute: $\lim_{x\to 4^-} f(x) =$

(b) compute: $\lim_{x\to 4^+} f(x) =$

(c) Graph $f(x)$

8. Compute: $\lim_{x\to-\infty}\frac{9x^4+4x-8x}{3x^5-8x^2-5}=$

9. $f(x)=6x^4-8x^3+12x^2+24x-5;$ Compute: $f'(x)$.

10. $\frac{d}{dx}\left[-3\sin(x)+3\cos(x)\right]=$

11. $f(x)=2x^2-3x+3$; compute $f'(x)$ **using the definition of derivative.** (i.e., compute $f'(x)$ using the "limiting process.")

12. Compute: $\frac{d}{dx}\left[(x^3+5x+4)\sin(x)\right] =$

13. Compute: $\frac{d}{dx}\left[\frac{\cos(x)}{\sin(x)+x^2}\right] =$