

Exam 2

Name: _____

TA's Name _____

Section Time _____

Problem	Score
1	
2	
3	
4	
Total	

No calculators, notes, or books are allowed.
You must show all your work, and explain your reasoning to receive credit for your answers.

Work the problems in an order that will maximize your score, and check your answers whenever possible.

Good luck!

1. Find the following limits. If the limit does not exist, say whether it is ∞ , $-\infty$, or if the right- and left-hand limits do not agree.

(a) [10 points] $\lim_{x \rightarrow 2} \frac{x^2 + 3}{x + 2}$

(b) [10 points] $\lim_{x \rightarrow 3} \frac{x^2 - 4x + 3}{x - 3}$

(c) [10 points] $\lim_{x \rightarrow 3^+} \frac{x - 5}{(x - 3)^2}$

(d) [10 points] $\lim_{x \rightarrow \infty} \frac{3x^2 - 1}{(x - 2)^2}$

2. (a) [8 points] Differentiate the following function: $f(x) = 4x^5 + 3x^4 + 6x^2 + 1$

(b) [10 points] If $f(x) = \frac{(2x^3 - x)^4}{2x^2 - 1}$, find $f'(1)$.

3. [12 points] Let $f(x) = \frac{x^2 + 3x}{(x+6)(x+3)}$. If we set $f(-3) = -2$, is f continuous at 3? Why or why not?

4. Suppose that a particle moves along a coordinate line, and the particle's position at time t is given by $s(t) = (t^2 - 5)^3$.

(a) [10 points] Find the velocity function $v(t)$ of the particle.

(b) [10 points] Find the acceleration function $a(t)$ of the particle. Simplify your answer as much as possible.

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(c) [10 points] For which $t > 0$ is the velocity momentarily constant?