

Math 191 Section X03
Test One

Time: 50 minutes

Total: 25 marks

Name: _____

1. [3 marks] Evaluate the following limit:

$$\lim_{x \rightarrow -4} \frac{x^2 + 12x + 32}{x^2 - 16}$$

2. [3 marks] An object's displacement (in metres) is given by $s(t) = 0.3t^4 - 8t^2 + 1.9t$, where t is measured in seconds. Find the object's acceleration at $t = 2$ seconds.

3. [5 marks] Use the **limit definition** to find $f'(x)$ for $f(x) = 7x^2 - 4x$

4. [4 marks] Find $f'(x)$ and **simplify fully**:

$$f(x) = \frac{3-4x}{7x+2}$$

5. [6 marks] Find y' :

a) $y = 2x(3x + 1)^7$

b) $y = 8(\sqrt{7x - 4})$

c) $y = \frac{-3}{(x^2 - 6)^4}$

6. [4 marks] Find $\frac{dy}{dx}$:

$$5x - 3x^2y^3 = 7y^5 - 12x^2$$