MAC2311 Section U08
Suggested problems for Test 2
(Test 2 is Friday March 3rd, in class)

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1. Write down the **definition** of the derivative.

2. Use the **definition** of the derivative to find the derivative of $f(x) = x^2$.

3. Use the **definition** of the derivative to find the derivative of $f(x) = \frac{1}{x}$.

4. Find dy/dx.

$$y = 3x^8 + 2x + 1$$

5. Find dy/dx.

$$y = \frac{1}{2}(x^4 + 7)$$

6. Find dy/dx.

$$y = \sqrt{2}x + (1/\sqrt{2})$$

7. Find dy/dx.

$$y = \frac{x^2 + 1}{5}$$

8. Find $f'(x)$.

$$f(x) = x^{-3} + \frac{1}{x^7}$$

9. Find $f'(x)$.

$$f(x) = \sqrt{x} + \frac{1}{x}$$

10. Find $f'(x)$.

$$f(x) = x^e + \frac{1}{x^{\sqrt{10}}}$$

11. Find $f'(x)$.

$$f(x) = (3x^2 + 1)^2$$

12. Find $f'(x)$.

$$f(x) = (3x^2 + 6)(2x - \frac{1}{4})$$

13. Find $f'(x)$.

$$f(x) = (2 - x - 3x^3)(7 + x^5)$$

14. Find $f'(x)$.

$$f(x) = \frac{x - 2}{x^4 + x + 1}$$

15. Find $f'(x)$.

$$f(x) = (x^3 + 2x)^{37}$$

16. Find $f'(x)$.

$$f(x) = \sin\left(\frac{1}{x^2}\right)$$

17. Find $f'(x)$ using any correct method.

$$f(x) = \left(\frac{1 + x^2}{1 - x^2}\right)^{17}$$

18. Find dy/dx using any correct method.

$$x^3 + y^3 = 3xy^2$$

19. Find d^2y/dx^2 using any correct method.

$$x^3 + y^3 = 1$$

20. Find dy/dx.

$$y = \ln 5x$$

21. Find dy/dx.

$$y = \ln|x^2 - 1|$$

22. Find dy/dx.

$$y = \ln(x^2)$$

23. Find dy/dx.

$$y = (\ln x)^3$$

24. Find dy/dx.

$$y = \ln\left(\frac{x}{x^2+1}\right)$$

25. Find dy/dx.

$$y = \ln(\ln x)$$