

Math 1A practice Midterm 2

You are allowed 1 sheet of notes. Calculators are not allowed. Each question is worth 3 marks, which will only be given for a clear and correct answer in simplified form.

The questions on this practice midterm are all exercises in Stewart; the exercise number is given at the end of the question so you can check your answer. (In the real midterm the questions will usually be slightly modified versions of questions in Stewart.)

1. Differentiate $h(\theta) = \csc(\theta) + e^\theta \cot(\theta)$. (3.4.7)
2. Differentiate $\sin(\tan(\sqrt{\sin(x)}))$. (3.5.41)
3. Find dy/dx by implicit differentiation if $x^3 + x^2y + 4y^2 = 6$. (3.6.7)
4. Find a formula for the n 'th derivative $f^{(n)}(x)$ if $f(x) = 1/3x^3$. (3.7.37)
5. Differentiate the function $\log_2(1 - 3x)$. (3.8.5)
6. Find the derivative of $y = \tanh^{-1} \sqrt{x}$ (3.9.43)
7. Find the linearization of the function $f(x) = x^3$ at $x = 1$. (3.11.5)
8. Find the differential of the function $y = x \log(x)$. (3.11.17)
9. Find the critical numbers of the function $f(x) = x^3 + 3x^2 - 24x$ (4.1.33)
10. Show that the equation $x^3 - 15x + c = 0$ has at most one root in the interval $[-2, 2]$. (4.2.19)
11. Find the intervals on which f is increasing or decreasing and the local maximum and minimum values of f if $f(x) = x - 2 \sin(x)$, $0 < x < 3\pi$. (4.3.15)
12. Find $\lim_{x \rightarrow 0} \tan(px) / \tan(qx)$ (4.4.13)
13. Find $\lim_{x \rightarrow 0} (x + \sin(x)) / (x + \cos(x))$. (4.4.29)
14. Sketch the curve $y = x - 3x^{1/3}$. (4.5.27)
15. Graph the function $f(x) = x^{1/x}$. (4.6.23)