

NAME: _____

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MATH 181 TEST 2 SAMPLE TEST

NOTE: The actual exam will only have 13 questions. The different parts of each question (part A, B, etc.) are variations. Know how to do all the variations on this exam.

1A.) (4 pts) Find the derivative: $y = \frac{x^3}{3} + 4\sqrt{x} - 3e^{-x} + 5 \sin x - \frac{1}{\pi+1}$ 1A. _____

1B.) (4 pts) Find the derivative: $y = \frac{x^4}{4} - 6 \cdot \sqrt[3]{x} + 7e^x - 3 \cos x - \frac{2\sqrt{7}}{e^2}$ 1B. _____

2A.) (4 pts) Find the velocity and acceleration functions $v(t) =$ _____

given: $s(t) = \frac{20t^3 - 2t^2 + 10\sqrt{t^3}}{5t^2}$

$a(t) =$ _____

2B.) (4 pts) Find the velocity and acceleration functions

given: $s(t) = \frac{10t^2 - 3t + 5\sqrt{t}}{\sqrt[5]{t}}$

$v(t) =$ _____

$a(t) =$ _____

3A.) (4 pts) Find the derivative of $f(x) = \frac{3x-1}{2-x^2}$ using the quotient rule.

3A. _____

3B.) (4 pts) Find the derivative of $f(x) = \frac{4x}{27-x^3}$ using the quotient rule.

3B. _____

4A.) (5 pts) Find the derivative of $f(x) = \left(\frac{2}{x-1}\right)^3$.

4A. _____

4B.) (5 pts) Find the derivative of $f(x) = \frac{2x}{\sqrt[4]{2x-5}}$.

4B. _____

5A.) (4 pts) Find y'' if $y = \tan x$.

5A. _____

5B.) (4 pts) Find y'' if $y = -\frac{1}{2}\cos(x^2)$.

5B. _____

6A.) (5 pts) Find the derivative of $f(\theta) = 4\sqrt{\sin\left(\frac{\theta}{2}\right)}$.

6A. _____

6B.) (5 pts) Find the derivative of $f(x) = \cos^4(x^2 - 3)$.

6B. _____

7A.) (6 pts) Find the derivative of $y = 3x^7\sqrt{x^2 - 3x}$ using product rules and chain rules.

7A. _____

7B.) (6 pts) Find the derivative of $f(x) = (5x^6 - 2x)\cot^3 x$ using product rules and chain rules.

7B. _____

8A.) (5 points) Use $4x^2 + y^2 - 2xy - 7 = 0$ for the following questions:

i.) Find $\frac{dy}{dx}$ by implicit differentiation.

i. _____

ii.) Use your answer in part a to find the **equation** of the tangent line at the point $(1, 3)$ on the curve.

ii. _____

8B.) (5 points) Use $\sin xy = x + y$ for the following questions:

i.) Find $\frac{dy}{dx}$ by implicit differentiation.

i. _____

ii.) Use your answer in part a to find the **equation** of the tangent line at the point $(0, 0)$ on the curve.

ii. _____

9A.) (4 pts) Find the derivative of $f(x) = \ln(3x - 4e^{x^2})$.

9A. _____

9B.) (4 pts) Find the derivative of $f(x) = \ln(\sec x - 2e^{3x})$.

9B. _____

10A.) (5 pts) Find the derivative of $y = \ln \sqrt{\frac{2x-3}{x-4}}$.

10A. _____

10B.) (5 pts) Find the derivative of $y = \ln \frac{(x^3 - 1)^4 \cdot \sqrt{3x - 1}}{x^2 + 4}$.

10B. _____

11A.) (4 pts) Find the derivative of $y = 3x \cdot 2^{-5x}$.

11A. _____

11B.) (4 pts) Find the derivative of $y = \frac{x^3}{3^x}$.

11B. _____

12A.) (6 pts) Use logarithmic differentiation to find the

derivative of: $y = \left(\frac{4\theta \cdot \sin \theta}{1 - \cos \theta} \right)^{\frac{1}{4}}$

12A. _____

12B.) (6 pts) Use logarithmic differentiation to find the

derivative of: $y = \theta^{\csc \theta}$

12B. _____

13A.) (4 pts) Find the derivative of $y = \ln 3 \cdot \log_3(\tan x)$
and simplify.

13A. _____

13B.) (4 pts) Find the derivative of $y = \log_4\left(\frac{3x-5}{2x+7}\right)$
and simplify.

13B. _____

MATH 181 TEST 2 REVIEW PROBS

<u>Section</u>	<u>Problems</u>
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3.3	#1 – 12, 17 – 26, 29 – 38, 41, 42, 45, 46, 51
3.4	#1 – 6 NOTE: Part B only. Just find $v(t)$ and $a(t)$.
3.5	#1 – 14, 18 – 30, 33
3.6	#1 – 6, 9 – 48, 51 – 54, 59 – 64
3.7	#1 – 16, 31 – 40 (part A only)
3.8	#11 – 28, 41 – 52, 63 – 82, 89 – 96

The test will be closed-book, and no notes are allowed (no notecards are allowed either). The exam will consist of problems similar to the ones on the sample test and the above list of review problems.