

Name _____ Period _____ Date _____

This Practice Test in its entirety is NON-CALCULATOR

Vocabulary: **Directions** – Define each word *and* give an example.

1. Jerk (as it relates to derivatives!)
2. Explicitly-Defined Function

Short Answer

3. Explain why the derivatives of the cofunctions of the inverse trigonometric functions are the opposite of the derivatives of the inverse trigonometric functions.
4. Write the steps for implicit differentiation.
5. When is it necessary to use logarithmic differentiation?

Review

6. What is the instantaneous rate of change at $x = 2$ for the function f given by $f(x) = \frac{x^2 - 2}{x - 1}$?
7. What is the maximum acceleration attained on the interval $0 \leq t \leq 3$ by the particle whose velocity is given by $v(t) = t^3 - 3t^2 + 12t + 4$?

Unit Three Problems

Directions: Show all work completed to obtain your final answers. Partial credit may be given for incorrect answers. No credit may be given for problems without work if it is required to obtain the answer. Circle or box in your final answers.

8. Use implicit differentiation to find $\frac{dy}{dx}$ if $x^2 + 5xy + y^5 = 8$.

9. If $f(x) = \sec\left(\frac{x}{2}\right)$, find $f'\left(\frac{\pi}{3}\right)$.

10. If $f(x) = \frac{\sqrt[3]{7-x}}{x^2}$, find $f'(x)$.

11. Find $\frac{d}{dx}[\sin^3(2x) \cdot \tan x]$.

12. Find $\frac{dy}{dx}$ if $y = \sec^{-1}(3x)$.

13. Find $\frac{dy}{dx}$ if $y = 4^{-x+3}$.

Multiple Choice Questions: **Circle the best answer.**

14. If $f(x) = \sin(e^{-x})$, then $f'(x) =$

- (A) $-\cos(e^{-x})$ (B) $\cos(e^{-x}) + e^{-x}$ (C) $\cos(e^{-x}) - e^{-x}$
(D) $e^{-x} \cos(e^{-x})$ (E) $-e^{-x} \cos(e^{-x})$

15. An equation of the line tangent to the graph of $y = x + \cos x$ at the point $(0, 1)$ is

- (A) $y = 2x + 1$ (B) $y = x + 1$ (C) $y = x$ (D) $y = x - 1$ (E) $y = 0$

16. If $f(x) = \ln|x^2 - 1|$, then $f'(x) =$

- (A) $\left| \frac{2x}{x^2 - 1} \right|$ (B) $\frac{2x}{|x^2 - 1|}$ (C) $\frac{2|x|}{x^2 - 1}$ (D) $\frac{2x}{x^2 - 1}$ (E) $\frac{1}{x^2 - 1}$