Name_____ Date_____ Period_____Score_____/70

Unit 2 BIG QUIZ - Derivatives

For the problem below use *either* definition of the derivative to find the derivative (2 points).

1. $y = \sqrt{x}$ 1._____

2. (2 points) If $f(x) = 10x^2$, find $f'(-1) =$ 2. _____

a) -20 b) -10 c) 10 d) 20

Find the derivatives for the following (3 points each):

3. $y = 4x^2 + \cos x$ 3._____

4. $y = \sqrt{\sin x}$ 4._____

5. $y = x^3 \tan x$ 5._____

6. $y = \dfrac{x-5}{x+5}$ 6._____

7. $y = \dfrac{1}{x^4} - \dfrac{1}{x} + x^3$ 7._____

8. $y = x^4\sqrt{x+1}$ 8. _____

9. If $f(x) = (4x)^{5/2}$, find $f'(1) =$ 9._____

10. $y = \sin(6x-1)$ 10. _____

Use the following table for 11-13. (2 points each)

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
0	2	0	1	1
1	3	2	3	2
2	4	1	-5	1

11. If $h(x) = f(x) \cdot g(x)$, find $h'(1) =$

a) 36 b) 13 c) 12 d) 0 11._____

12. If $h(x) = f \circ g(x)$, find $h'(0) =$ 12._____

a) 2 b) 4 c) 6 d) 8

13. If $h(x) = \dfrac{f(x)}{g(x)}$, find $h'(2) =$ 13._____

a) $-\dfrac{4}{5}$ b) $-\dfrac{9}{25}$ c) $-\dfrac{1}{25}$ d) $-\dfrac{1}{5}$

14. Find $\dfrac{dy}{dx}$ for the following (use implicit differentiation) (5 points):

$$4xy + 3x^3y^2 = 20$$ 14. _____

15. Find the <u>slope</u> of the curve $y = 3x^3 - 7x^2 + 12x + 1$ at x = 1 (3 points) 15. _____

16. Find the <u>slope</u> of the tangent line of $x^2 + 3xy + y^2 = 11$ at the point (1, 3) (4 points) 16. _____

17. Find the <u>equation</u> of the tangent line of $y = x^2 + 3x - 4$ at x = 2. (4 points) 17. _____

18. Find the value(s) of the horizontal tangent(s) for $y = 2x^3 - 3x^2 - 12x + 20$. (4 points) 18. _____

19. Find the second derivative for $y = \frac{x^3}{6} - 9x^2 + 6x - 5$. (4 points) 19. _____

Find the derivatives for the following (4 points each):

20. $g(x) = \left(\cos\left(\frac{x}{2}\right)\right)^4$ 21. $y = \sin^3(\sqrt{x})$ 20. _____

21. _____

22. $y = e^{\cos(8x)}$ 22. _____

Bonus: At what point is the tangent to the curve $y = 2x^2$ parallel to the line $y - 12x - 10 = 0$ (2 points) Bonus: _____