Name: ______________________________ Date:______________

Corrective Assignment

Unit 3 CA – Composite, Implicit, and Inverse Functions

Find $\frac{dy}{dx}$.

1. $y = \frac{e^{\tan 3x}}{3}$

2. $y = \ln(\sin 5x)$

3. $y = x\ln(4x)$

4. $e^{y^2} = x^5 + 10$

5. $y = \cos^{-1}(7x^3)$

6. $2x^3 - xy = \ln(y)$

Find the equation of the tangent line at the given point.

7. $4x^3 = -5xy + 4y$ at $(1, -4)$

8. $y = \arccos(5x)$ at $x = -\frac{\sqrt{3}}{10}$

9. $h(x) = (2x-1)^3(x+2)$ at $x = 1$.

10. Find the equation of any horizontal tangent lines for the graph of $(y^3+1)^2 = x^2 + 4x + 4$.

11. Slope of the tangent line of $g(x) = 4\sin^3 x$ at $x = \frac{\pi}{4}$.

12. Let f and g be differentiable functions where $g(x) = f^{-1}(x)$ for all x. $f(6) = 8$, $f(8) = 2$, $f'(6) = -3$, and $f'(8) = 4$. What is the value of $g'(8)$?

Find $\frac{d^2y}{dx^2}$ based on the given information.

13. $y = e^{x^4}$

14. $5y^2 + 3 = x^2$

Evaluate the 2^{nd} derivative at the given point.

15. If $f(x) = x^3 + \frac{5}{x}$, find $f''(-1)$.

16. If $x^2 + y^2 = 13$, find $\frac{d^2y}{dx^2}$ at $(2, 3)$.

The table below gives values of the differentiable functions g and h, as well as their derivatives, g' and h', at selected values of x.

x	$g(x)$	$g'(x)$	$h(x)$	$h'(x)$
-1	0	4	3	6
0	9	2	0	-4
3	-1	-2	9	4
9	3	1	16	9

17. If $f(x) = \frac{g(x)}{\sqrt{h(x)}}$, find $f'(3)$.

18. Find $\frac{d}{dx}h^{-1}(9)$.

19. Find the equation of the tangent line to $g^{-1}(x)$ at $x = 3$.

Unit 3 Corrective Assignment – Answers

1. $e^{\tan(3x)}\sec^2(3x)$	2. $5\cot(5x)$	3. $\ln(4x) + 1$	4. $\frac{5x^4}{2ye^{y^2}}$
5. $-\frac{21x^2}{\sqrt{1-49x^6}}$	6. $\frac{6x^2-y}{\frac{1}{y}+x}$	7. $y + 4 = 8(x - 1)$	8. $y - \frac{5\pi}{6} = -10\left(x + \frac{\sqrt{3}}{10}\right)$
9. $y - 3 = 19(x - 1)$	10. $y = -1$	11. $3\sqrt{2}$	12. $-\frac{1}{3}$
13. $12x^2e^{x^4} + 16x^6e^{x^4}$	14. $\frac{5y-\frac{x^2}{y}}{25y^2}$	15. -16	16. $-\frac{13}{27}$
17. $-\frac{16}{27}$	18. $\frac{1}{4}$	19. $y = x + 6$	