Calculus Review On Finding Derivatives (Work on seperate paper)

Find the derivative explicitly

1. $y = (3x^2 + 1)^4$

2. $f(x) = x^2(x-2)^4$

3. $f(x) = \dfrac{5}{(x^2 - 3x)^3}$

4. h (r) = $\dfrac{7}{\sqrt[4]{3r^3 - 4r^2 + 9}}$

5. f (t) = $3t^{\frac{2}{3}} + 5t^{\frac{1}{2}} - 4t + 13$

6. $y = \dfrac{1}{\sqrt{x^3 + 2}}$

7. $y = \dfrac{3x^2 - 5}{2x + 1}$ (answer as one fraction with no parentheses)

8. y = 3 tan (4x)

9. $y = \sec^3(2x)$

10. $y = \csc(\dfrac{x}{2} + \dfrac{\pi}{4})$ (show method do not use formula or memorized derivative)

11. $y = 1 - \cos 2x + 2\cos^2 x$ (think hard this is an interesting problem stick with it)

12. $y = \sin^2 x - \sin 2x + \cos^2 x$ (maybe use substitution before taking derivative final answer should only have cosines in it)

Derivatives for (Transcendental functions)

1. Find the second derivative of y = ln (cos 5x)

*answer should be one trig function after taking the first derivative

2. Find the second derivative of $y = x \bullet \ln(x) - x$

*answer should be one term containing natural log function after taking the first derivative (product rule will be needed)

3. Find the first derivative of $y = e^{5x^2} \bullet \ln(30x^2)$

More Practice with Derivatives

#1. $y = (3x^4 + 7)^3 (5x^3 - 4)^5$

#2. $y = \dfrac{(2x+1)^3}{(3x-4)^5}$

#3. $y = \sin^3 \sqrt{2x^3 + 11}$

#4. $y = 5x^2 \cdot \tan(3x)$

Exponentials

4. $y = e^{3x^2 - 5}$

5. $y = (12x^2 - 5)^4 \cdot e^{2x^3}$

6. $y = \sin(4e^{\sin 2x})$

Natural Logs

7. $y = \ln(x^2 + 3)^4$

8. $y = \tan(5x^2)\ln[\sin(5x^2)]$

9. $y = 5^{(x^2+3)^4}$

10. $y = 7x^{7x}$

11. $y = \left(2x^3 - 5\right)^{11} \cdot \sqrt{4x^2 + 5}$

All the Differentiation Rules

12. $y = \left(x^2 + 1\right)^2 \cdot \tan^{-1}(x)$

13. $y = \dfrac{e^x}{e^x - 1}$

14. $y = e^{3x} \cdot \ln(3x)$

15. $y = \ln[\cos(x)] \cdot \sec^{-1}\left(\dfrac{2}{x}\right)$

16. $y = e^{\tan(x^2-1)} \cdot \cos(x^2 - 1)$

17. $y = \csc^3\left[\ln\left(3x^2 + 2\right)\right]$

18. $y = \sin^{-1}\left(\dfrac{e^{2x}}{3}\right)$

* Question: Will the line tangent to the curve of a trigonometric function consist of a trig function.

* Concept: Be able to write the line tangent to a curve.

* Concept: Be able to write the normal line (line perpendicular to the tangent) to a curve.

* Concept: Be able to recognize answers that are written in alternative forms.