Calculus I
Chapter 3 Test

Instructions: In all the problems, find the derivative, get rid of any negative exponents and complex fractions appropriately and then stop, don't simplify ANY FURTHER!

In problems 1-3, find the derivative

1. $y = 2x^4 - 3x^2 - 7x - 1$

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

3. $y = \frac{2}{3x^2} + \frac{5}{x} - 8x$

Find the second derivative:

4. $y = x^5 - 2x^3 + x^2 - x - 2$

In problems 5 and 6, find y' using the product rule

5. $y = (x^3 - 5x^2 + 2x)(x^2 - 7x)$

6. $y = \left(\frac{-3}{x^2} - 1\right)\left(x^5 - \frac{1}{x} + 5\right)$

Find the derivative of the function

7. $y = \frac{x^2 + 4x - 2}{x^3 - 7x^2}$

8. Find an equation for the tangent to the curve $y = \frac{1}{x^2 - 2x}$ at the point (1, -1)

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Find the derivative:

9. $y = \sin^2(5x) - \dfrac{3x}{\cos x}$

Find the derivative

10. $q = \sqrt[5]{x - x^3}$

11. $h(x) = \left(\dfrac{\sin^2 x}{\cos x}\right)^{\frac{1}{2}}$

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Use implicit differentiation to find dy/dx

12. $3xy - y^3 = 2y + 7$

13. $\frac{4x-1}{5x} = x^5 - y^4$

14. $\sin(xy) - 4x = y$

Use log differentiation to find the derivative of y

15. $y = \sqrt[4]{x(x-7)(x+3)}$

Find the derivative

16. $y = \ln(2x^3)$

17. $y = 4x^2e^{4x} - 7x$

18. $y = e^{x^2-x} + 3x - \sin x$

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

20. $y = (x^3 - 4x + 2)e^{x^2-2x}$