

General Directions: Answer each question thoroughly. Incorrect answers with work shown may receive partial credit, but unsubstantiated answers will receive NO CREDIT. I do not want (decimal) approximations unless specifically asked for. I want the exact numbers. Justify all claims using calculus concepts (i.e., theorems, definitions, etc.). I am looking for mathematical logic and reasoning. Show all of your work!! Explain! Explain! Explain!

Activity Directions: As a class, we will discuss which rules or patterns apply to each problem. In your groups, try to compute as many of the following derivatives as you can.

1. $\frac{d}{dx}x^2 - 3x + 5$

14. $\frac{d}{dx}5^x$

2. $\frac{d}{dx}3x^5 - 4x^3 + 5x$

15. $\frac{d}{dx}(x+1)e^x$

3. $\frac{d}{dg}\sqrt{g^2 - 3g + 5}$

16. $\frac{d}{dn}\sqrt{3n+5}(5n^2-1)$

4. $\frac{d}{dv}3ve^{3v}$

17. $\frac{d}{dk}(3k-2)(5k+3)$

5. $\frac{d}{dy}5y^2 - 3y^4 + 4y + 4$

18. $\frac{d}{dh}\frac{1}{\sqrt{4h+8}}$

6. $\frac{d}{dt}e^{4t^2-5t+3}$

19. $\frac{d}{dx}13x^2 - 3x^3 + 5x$

7. $\frac{d}{dw}\frac{3}{2w-1}$

20. $\frac{d}{dz}\sqrt{\frac{3}{z}}$

8. $\frac{d}{dt}\frac{4}{3t^2-2t+1}$

21. $\frac{d}{dy}(y^2-3y+5)^{-2}$

9. $\frac{d}{dw}(3w-4)^5$

22. $\frac{d}{dx}\left(\frac{3}{x}\right)^{-2}$

10. $\frac{d}{dx}(3x+2)e^{3x}$

23. $\frac{d}{dz}\frac{z^2-3z+5}{3z}$

11. $\frac{d}{dx}\frac{x^3-1}{x^2+3x-2}$

24. $\frac{d}{dy}3y(5y^4+4y-3)$

12. $\frac{d}{dk}(k^2-3k+5)(3k^4-5)$

25. $\frac{d}{dx}(x^2-3x+5)(3x-5)$

13. $\frac{d}{dm}e^{3m+2}$

26. $\frac{d}{dx}\left(\frac{x}{5x^2-4x}\right)^{-1}$