

Unit 1 – Wkst 4 – Product Rule, Quotient Rule, Chain Rule

No Calculator.

Find each derivative using proper notation.

1. $y = 25$

2. $h(x) = 6\sqrt{x} + 3\sqrt[3]{x}$

3. $f(\theta) = 4\theta - 5\sin \theta$

4. Find the equation of the line tangent to the graph of $f(x) = \frac{27}{x^3}$ at the point $(3,1)$.

Find each derivative using proper notation.

5. $f(x) = (5x^2 + 8)(x^2 - 3x - 6)$

6. $h(x) = \sqrt{x} \cos x$

7. $f(x) = \frac{x^2 + x - 1}{x^2 - 2}$

8. $y = \frac{x^4}{\cos x}$

9. $y = 4x^2 \sec x$

10. $g(x) = \sin x \cos x$

Find the second derivative of the function. Use proper notation always!

11. $g(t) = -8t^3 - 3t + 12$

12. $f(\theta) = 3 \tan \theta$

Find each derivative.

13. $y = (7x + 3)^4$

14. $y = \frac{1}{x^2 + 4}$

15. $y = 5\cos(9x + 1)$

16. $y = \frac{x}{2} - \frac{\sin 2x}{4}$

17. $y = x(6x + 1)^5$

18. $f(x) = \frac{3x}{\sqrt{x^2 + 1}}$

19. $h(x) = 5\tan^3(4x^2 - 3)$

20. $g(x) = \frac{2\sin^2(3x)}{x}$

21. Find the value(s) of x in the interval $0 \leq x \leq 2\pi$ at which the slopes of $y = \cos^2 x$ and $y = \sin^2 x$ are equal.