

DO ALL WORK ON A SEPARATE SHEET OF PAPER!**Problems 1-12:** Find the derivative of each function.

1. $f(x) = 6x^3 - 9x + 4$

6. $f(x) = 10\sqrt[5]{x^3} - \sqrt{x^7} + 6\sqrt[3]{x^8} - 3$

2. $y = 2t^4 - 10t^2 + 13t$

7. $f(t) = \frac{4}{t} - \frac{1}{6t^3} + \frac{8}{t^5}$

10. $g(y) = (y-4)(2y+y^2)$

3. $g(z) = 4z^7 - 3z^{-7} + 9z$

11. $h(x) = \frac{4x^3 - 7x + 8}{x}$

4. $h(y) = y^{-4} - 9y^{-3} + 8y^{-2} + 12$

8. $R(z) = \frac{6}{\sqrt{z^3}} + \frac{1}{8z^4} - \frac{1}{3z^{10}}$

12. $f(y) = \frac{y^5 - 5y^3 + 2y}{y^3}$

5. $y = \sqrt{x} + 8\sqrt[3]{x} - 2\sqrt[4]{x}$

9. $z = x(3x^2 - 9)$

13. Find the equation of the **tangent line** in slope-intercept form to $y = 4e^x + (x - 1)^2$ at $x = 0$.
14. At what point(s) does the function $f(x) = x^3 + 9x^2 - 48x + 2$ have a horizontal tangent line?
15. Is the function $g(x) = 2x^4 + 10x^2 + 14$ increasing, decreasing, or constant when $x = -2$?
16. Find the equation for the tangent line to the function $f(x) = 7x^4 + 8x^{-6} + 2x$ at $x = -1$.