

1.) Calculate $\frac{d}{dx} x^7$ and $\frac{d}{dx} 1/x^7$.

2.) Calculate $\frac{d}{dx} x(x^7 + \frac{1}{x})$.

3.) Calculate $\frac{d}{dx} \frac{x + \sqrt[3]{x^2 - 4x}}{x^2}$.

4.) If $f(x) = x^3 + 3x + 1$ then calculate $f'(2)$ and find the equation of the tangent line at $x = 2$.

5.) Let $y = x^2 + \sqrt[2]{x} + 3^2$ and calculate $\frac{dy}{dx}$.

6.) Let $f(x) = x^2 - 6x + 8$ calculate $f'(x)$ and make a sign-chart to find where $f(x)$ is increasing or decreasing. Graph the function and check your results.