

1. Differentiate the function.

$$F(r) = \frac{5}{r^3}$$

$$y = 3e^x + \frac{4}{\sqrt[3]{x}}$$

$$G(q) = (1 + q^{-1})^2$$

2. Find equations of the tangent line and normal line to the curve at the given point: $y = x^2 + 2e^x$, $(0, 2)$

3. The equation of motion of a particle is $s = t^4 - 2t^3 + t^2 - t$, where s is in meters and t is in seconds.

(a) Find the velocity and acceleration as functions of t .

(b) Find the acceleration after 1 s.

4. Find an equation of a tangent line to the curve $y = x^4 + 1$ which is parallel to the line $32x - y = 15$.

5. Find the first and second derivatives of the function.

$$G(r) = \sqrt{r} - \sqrt[3]{r}$$