

Find the linearization of each function:

a) $h(x) = x^4 - 3x^2 - 1$ at $a = -1$.

b) $f(x) = \sin^2(x)$ at $a = \frac{\pi}{2}$.

c) $g(x) = \frac{1}{(1 + 3x)^4}$ at $a = 0$.

d) $r(t) = t^{\frac{3}{4}}$ at $a = 16$.

Use a linear approximation to estimate the value of $\sqrt[3]{9}$.

Use a linear approximation to estimate the value of $\tan(44^\circ)$.

The line tangent to the graph of $f(x) = \sin(x)$ at the point $(0, 0)$ is $y = x$. This implies that

- a) $\sin(0.0005) \approx 0.0005$
- b) The line $y = x$ touches the graph of $f(x) = \sin(x)$ at exactly one point, $(0, 0)$.
- c) $y = x$ is the best straight line approximation to the graph of f for all x .