

(1) Differentiate the following functions.

(a) $f(x) = x^5 + \pi x + 4.2$

(b) $g(s) = 4s + \frac{7}{s}$

(c) $h(t) = 5t^{\frac{1}{3}} - 2^t$

(d) $m(x) = x^{14} \sin x + \sqrt{\pi}$

(e) $f(t) = 5 \cos t + \frac{2}{\sqrt{t}}$

(f) $h(x) = \frac{x^2}{2} + 2xe^x$

(g) $g(x) = \frac{4}{x^2 + 5x + 6} + 2e^x$

(2) Find the tangent line at the indicated point.

(a) $y = 5x^2 + 1$ at $x = 1$

(b) $y = \frac{1}{x^2}$ at $x = 2$

(c) $y = x^3 - 3x$ at $x = 1$

(d) $y = 3^t$ at $t = 0$

(3) Differentiate the following functions.

(a) $f(x) = \cos \pi x$

(b) $g(t) = (t - 1)^8$

(c) $h(t) = (t^2 + t + 1)^{17}$