

Differentiate each function with respect to  $t$ .

1.  $f(t) = (t + 4)t^2$

2.  $f(t) = (4t^3)(t^2 - 4t + 2)$

3.  $h(t) = (5t^2 - 3t)\left(t - \frac{3}{4}t^2\right)$

4.  $g(t) = (t^3 - t)\left(1 - \frac{1}{t}\right)$

5.  $v(t) = \sin t \cos t$

6.  $g(t) = 4t^2e^t$

7.  $h(t) = \sin t (t^2 + 4t - 1)$

8.  $f(t) = t^{\frac{1}{5}} \ln t$

9.  $a(t) = \cos(t)e^t$

10.  $f(t) = (t^2 + 2t - 8) \ln t$

11.  $g(t) = \frac{2}{9}\left(t^{-\frac{1}{3}} - 4\right)(t^3 + t)$

12.  $v(t) = 3\sqrt[4]{t}e^t$

13.  $f(t) = (1 + \sin t)(1 + \cos t)$

14.  $A(t) = 2\pi t^4(1 + \sin t)$

15.  $h(t) = \frac{1}{5t^4}(\sin t + t)$

16.  $f(t) = \ln t(1 - e^t)$

17.  $d(t) = (1 + \sqrt{t^3})(t^{-3} - 2\sqrt[3]{t})$

18.  $f(t) = \sin^2 t$

19.  $g(t) = \frac{\sin t}{4t^2}$

20.  $f(t) = 2(t^2 + 3)(t^2 - 4) \sin t$