

MORE PRACTICE.

Find the indicated derivative in each case. You should try to simplify your answers if you can. Try quotient rule on problems 1, 10, 17, and 18.

1.  $f'(t)$  for  $f(t) = \frac{t^2}{\sqrt{t+1}}$

2.  $f'(x)$  for  $f(x) = \frac{x^2 + 1}{x^3}$

3.  $\frac{dz}{dx}$  for  $z = (x+1)^3(5-x)^4$

4.  $f'(\theta)$  for  $f(\theta) = \frac{1}{\tan(2\theta)}$

5.  $f''(x)$  for  $f(x) = 3x \cdot 2^{5x}$

6.  $f'(\beta)$  for  $f(\beta) = \frac{\beta y + y^6}{1 - \beta}$

7.  $\frac{dy}{dt}$  for  $y = \ln(\ln(2t^3))$

8.  $g'(x)$  for  $g(x) = x \cdot e^{x^2}$

9.  $x'(r)$  for  $x(r) = 3\sqrt[3]{r} - \sqrt{\frac{3}{r}} + \frac{1}{3r}$

10.  $h'(y)$  for  $h(y) = \frac{\cos y}{1 - \sin y}$

11.  $\frac{dz}{dx}$  for  $z = 10^{2 \log x}$

12.  $f'(x)$  for  $f(x) = \cosh(4x^2 + 1)$

13.  $f'(t)$  for  $f(t) = \arctan\left(\frac{2}{t}\right)$

14.  $g'(\theta)$  for  $g(\theta) = \sqrt{3\theta + \tan^2(4\theta)}$

15.  $f'(x)$  for  $f(x) = x \cos(e^x)$

16.  $\frac{dy}{du}$  for  $y = (\csc u + \sec u)^3$

17.  $g'(z)$  for  $g(z) = \frac{az^2}{a^2 + z^2}$

18.  $f'(x)$  for  $f(x) = \frac{x^2}{(2+x)^3}$

19.  $a'(t)$  for  $a(t) = \ln\left(\frac{1 - \cos t}{1 + \cos t}\right)^4$