

Practice the following problems using rules of derivative (primarily the chain rule in addition to the power, multiplicative, quotient rules)

6.  $y = \sqrt{4x^2 + 1}$

14.  $y = \frac{1}{(3x + 8)^2}$

22.  $f(x) = x^3\sqrt{5x + 2}$

26.  $f(x) = \left(\frac{2x}{x^2 + 1}\right)^3$

40. Find  $\frac{dy}{dt}$  if  $y = \frac{1}{3u^5 - 7}$  and  $u = 7t^2 + 1$ .

52. Let  $h(x) = \sqrt{1 + 5x^2}$ .

- a) Find functions  $f$  and  $g$  such that  $h(x) = (f \circ g)(x)$ .
- b) Find  $(f \circ g)'(4)$ .

- 60. Total cost.** A total-cost function is given by

$$C(x) = 2000(x^2 + 2)^{1/3} + 700,$$

where  $C(x)$  is the total cost, in thousands of dollars, of producing  $x$  airplanes. Find the rate at which total cost is changing when 20 airplanes have been produced.

- 64. Compound interest.** If \$1000 is invested at interest rate  $r$ , compounded monthly, in 3 yr it will grow to an amount  $A$  given by (see Section R.1)

$$A = \$1000 \left( 1 + \frac{r}{12} \right)^{36}.$$

- a) Find the rate of change,  $dA/dr$ , and give its units.
- b) Explain what  $dA/dr$  represents.