

## PROBLEM

Find the derivatives of

$$y = \sin(x^4)$$

and

$$y = \sin^4 x.$$

Explain the similarities and differences in technique.

## PROBLEM (LEVEL II)

Find the derivative.

(a)  $y = \cos^3(2x)$

(c)  $y = x^3 \sqrt{1 - x^2}$

(b)  $y = x \tan(7x)$

(d)  $y = \left( \frac{\sin x}{x + 2} \right)^2$

## PROBLEM

You already know that  $\frac{d}{dx} \left( \frac{f(x)}{g(x)} \right) = \frac{g(x) f'(x) - f(x) g'(x)}{(g(x))^2}$ .

Expressing  $\frac{f(x)}{g(x)} = f(x) \cdot [g(x)]^{-1}$ , differentiate this latter form

to show agreement with the Quotient Rule.