Sample Problems: Find the derivative of each function.

i. 
$$g(x) = 4(5x^3 + 2)^6$$

ii. 
$$g(x) = \sqrt{4x^2 + 1}$$

## The Chain Rule

If a function is the composition of two other functions, then the derivative is found using the rule:

$$h(x) = g(f(x))$$

$$h'(x) =$$

Try These:

Differentiate each function.

$$y = (x^2 - 4x)^3$$

**b** 
$$v = \sqrt{5x^2 - 2}$$

**a** 
$$y = (x^2 - 4x)^3$$
 **b**  $y = \sqrt{5x^2 - 2}$  **c**  $y = \frac{2}{\sqrt{1 - 3x}}$ 

1 
$$f(x) = (3x^4 + 2x)^5$$

2 
$$f(x) = 4(2x^2 + 3x + 1)^3$$

3 
$$f(x) = \frac{4}{x^2 + 3}$$

**4** 
$$f(x) = \sqrt[3]{2x+3}$$

7 
$$f(x) = (9x+2)^{\frac{2}{3}}$$
 8  $f(x) = \sqrt[4]{2x^2+3}$ 

**8** 
$$f(x) = \sqrt[4]{2x^2 + 3}$$

9 
$$f(x) = 5(x^3 + 3x)^4$$

9 
$$f(x) = 5(x^3 + 3x)^4$$
 10  $f(x) = \frac{1}{x^2 - 3x - 2}$