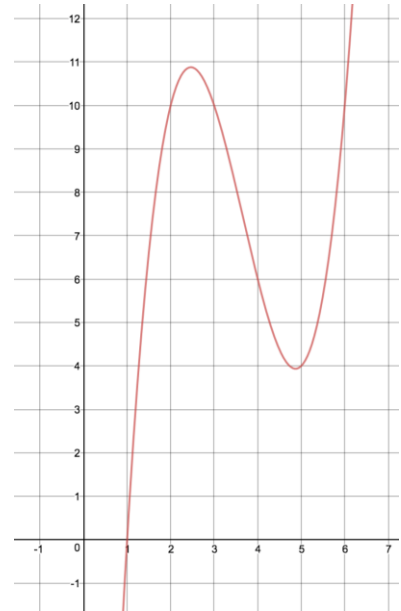


**Notes 15.5** General Power Rule to find the Derivative

1. Let  $f(x) = x^3 - 11x^2 + 36x - 26$

- a) Find the instantaneous rate of change at  $x = 2$ .



Let  $g(x) = 3x^2 - 22x + 36$

- b) Find  $g(2)$

- c) At the extreme points on the graph, the tangent line should be horizontal, so the instantaneous rate of change equals 0.  
Find where  $g(x) = 0$

**Power Rule to find Derivative**

If  $f(x) = x^n$ , then  $f'(x) = nx^{n-1}$   
Multiply by the original exponent and decrease the exponent by 1.

- d) Calculate quickly the rate of change at which  $f(x)$  is changing at  $x = 5$ .  
(in other words, calculate the derivative using the power rule, then evaluate at  $x=5$ )

Using the power rule, calculate the derivative  $f'(x)$ .

2.  $f(x) = 12x^4$

3.  $f(x) = 11x^3 - 3x^2 - 13x + 37$

For #3, use the fact that the derivative is 0 at an extreme point to find the x-coordinates of all extreme points.

For #3, find the equation of the line tangent to the graph at  $x = 2$ .