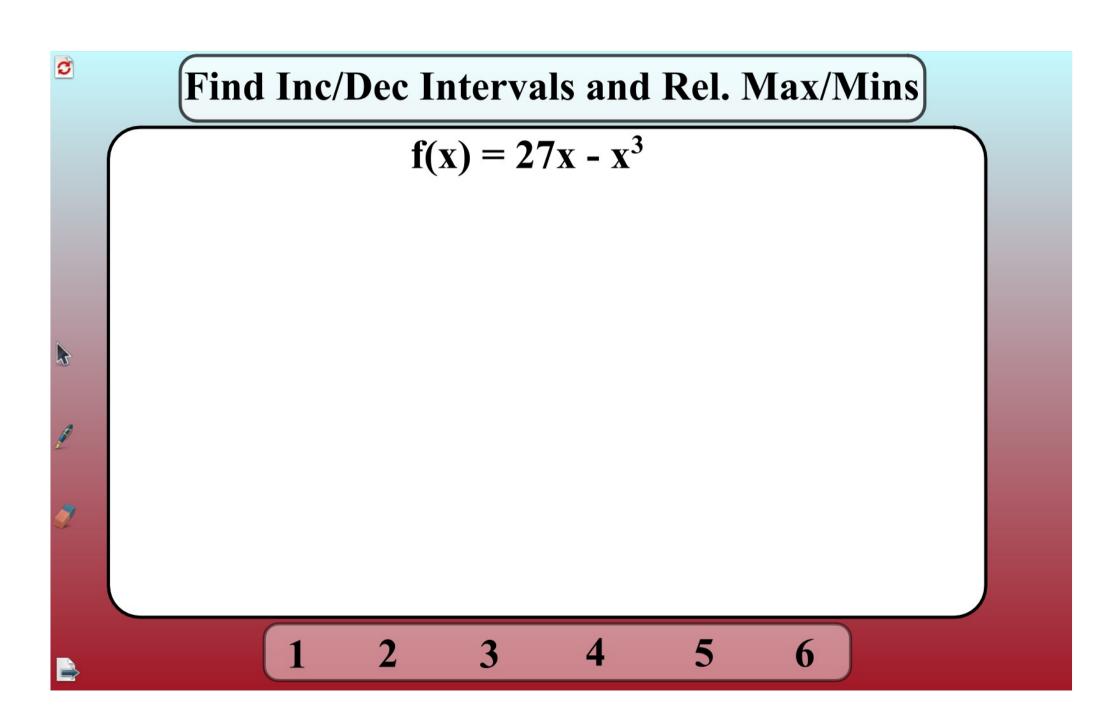# Increasing and Decreasing Intervals

We can use derivatives to identify the intervals where a function is increasing or decreasing and identify the relative max/mins by using the following rules:

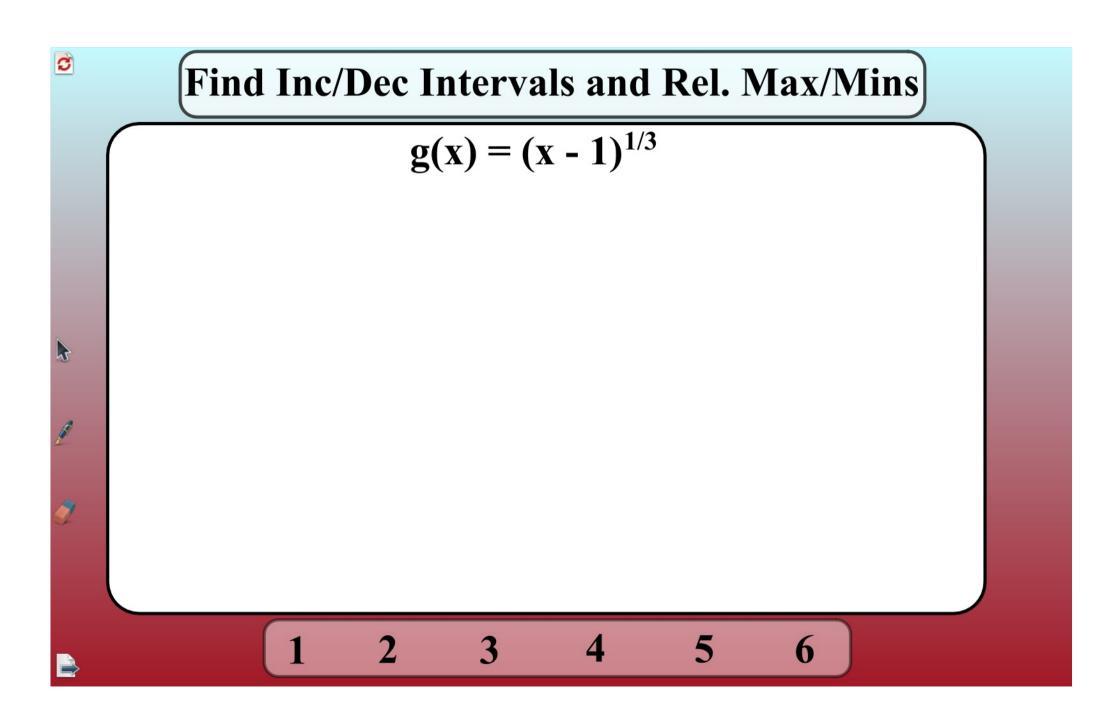If f'(x) > 0 for all x in (a,b), then f is increasing

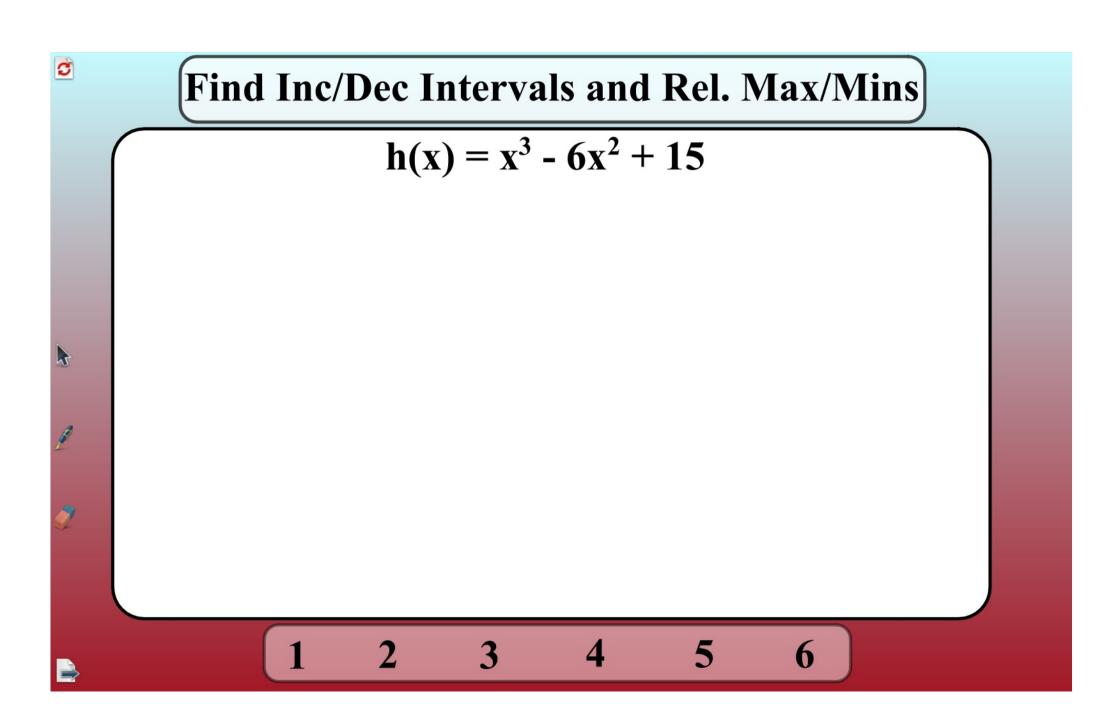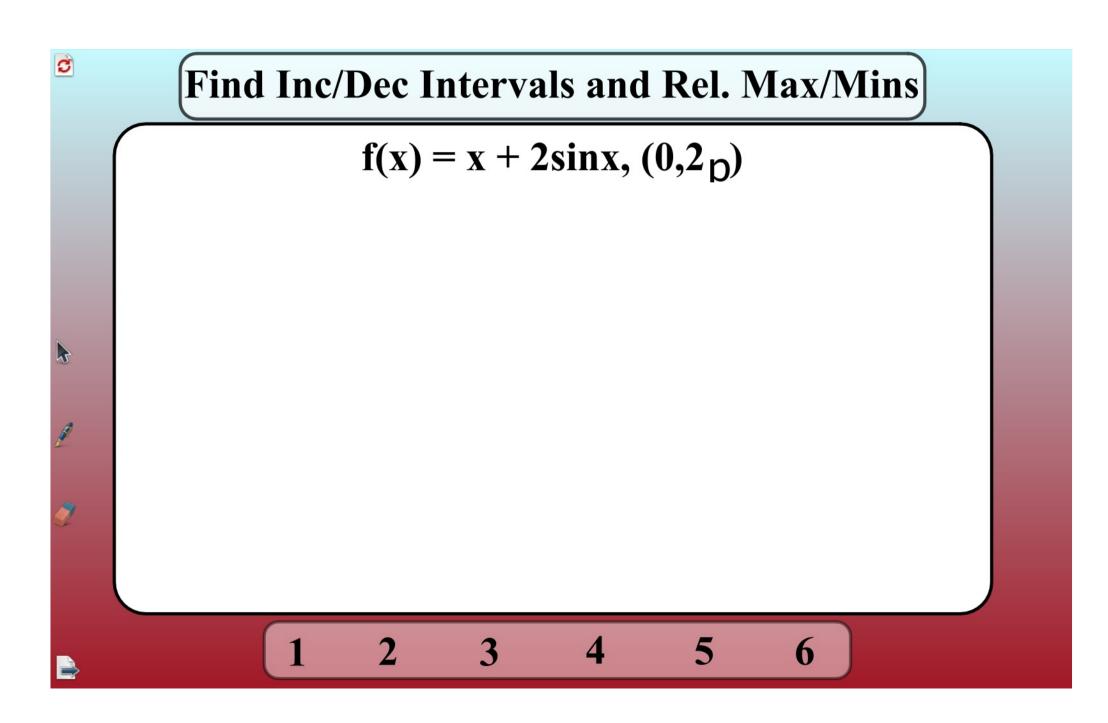If f'(x) < 0 for all x in (a,b), then f is decreasing

If f'(x) = 0 for all x in (a,b), then f is constant

Demo

$$f(x) = 27x - x^3$$

1   2   3   4   5   6

Find Inc/Dec Intervals and Rel. Max/Mins

$$f(x) = x^2/(x+1)$$

1   2   3   4   5   6

Find Inc/Dec Intervals and Rel. Max/Mins

$$g(x) = (x - 1)^{1/3}$$

$$h(x) = x^3 - 6x^2 + 15$$

1   2   3   4   5   6

$$f(x) = \cos^2 x - \cos x, \quad 0 < x < 2\pi$$

1   2   3   4   5   6

$$f(x) = x + 2\sin x, \ (0, 2\pi)$$

1   2   3   4   5   6

According to the Graph of f', Where is f Increasing or Decreasing and Where are the Relative Maximums and Minimums