Sec 6.7
Rates of Change in Trig Functions

Today we will examine the average and instantaneous rates of change in trig functions.

-recall: -relates to the slope of secant and tangent lines.
-relates to increasing and decreasing areas on the function

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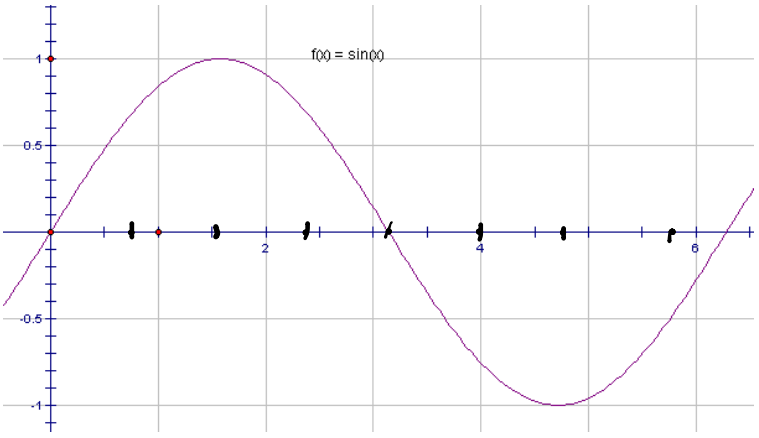
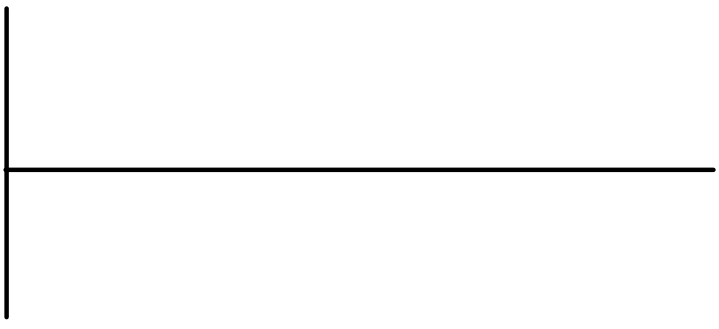
Compare the slopes of the tangents at: $0, \frac{\pi}{4}, \frac{\pi}{2}, \frac{3\pi}{4}, \pi, \frac{5\pi}{4}, \frac{3\pi}{2}, \frac{7\pi}{4}, 2\pi$



Note: there is a difference between a positive slope and positive function!



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Notice:

The tangent lines are zero at the max and min points of the sine curve.

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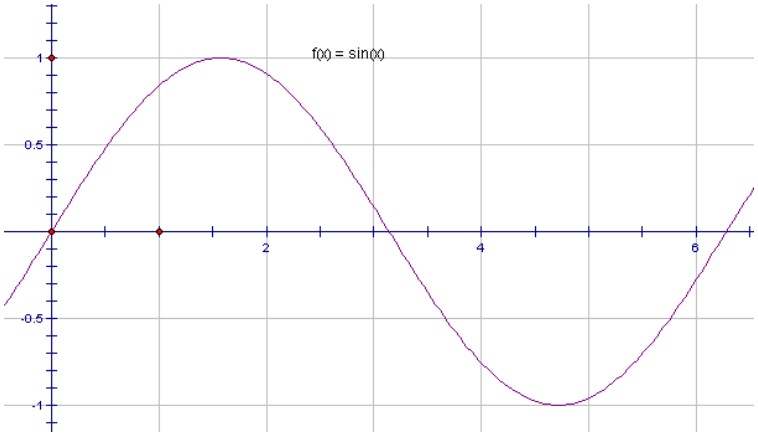
Where on this function will the tangent slopes be steepest?



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To calculate ARC

Use the slope formula

$$ARC = \frac{f(x_2) - f(x_1)}{x_2 - x_1}$$

To calculate IRC (choose one of these 3)

-draw an accurate line on the graph.

-find ARC for points very close to required point.

-use the difference quotient

$$IRC \doteq \frac{f(a+h) - f(a)}{h},\ h\ very\ small$$

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