

3.3. Higher-Order Derivatives

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3.3. Product and Quotient Rules

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3.4. Equations of Motion

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Supplemental Problems:
1³

3.5. Two Important Limits

Supplemental Problems:
2, 3

3.5. Derivatives of the Trigonometric Functions

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1⁴, 3⁴, 5⁴, 7⁴, 9⁴, 27, 28, 42, 43

Notes:

1. No need to graph. No need to simplify your answers.
2. Also, graph $y = y(x)$ and the tangent line on the grid provided.
3. Draw the graphs on the grids provided.
4. No need to graph.

Supplementary Problems:

- 1) A car completes a 0.25-mile (1320 ft) drag race in 9 seconds. The position x of the car (in ft), as a function of time t (in sec), is given by

$$x = \frac{440}{567}(30t^2 - t^3).$$

- a) Calculate the velocity $v = v(t)$ and acceleration $a = a(t)$ of the car.
- b) Graph $v = v(t)$ and $a = a(t)$ on the grids provided.
- c) Find the maximum velocity and maximum acceleration over $t \in [0, 9]$ seconds.

For problems **2** and **3**, use

$$\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$$

and the identity

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

to calculate the limits.

2)

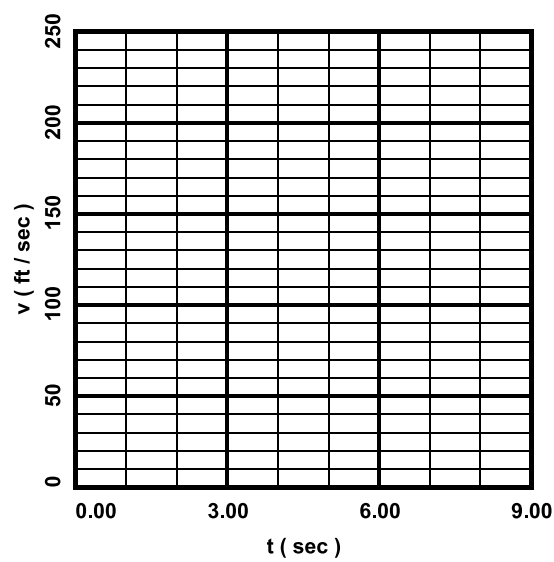
$$\lim_{\theta \rightarrow 0} \frac{\sin 2\theta - 2 \sin \theta}{\theta} = ?$$

3)

$$\lim_{\theta \rightarrow 0} \frac{\sin 2\theta}{\theta} = ?$$

Grids:

1)



27)

