

The background features a light gray gradient with several realistic water droplets of various sizes scattered across the frame. A faint, large circular pattern, resembling a ripple or a watermark, is centered in the background.

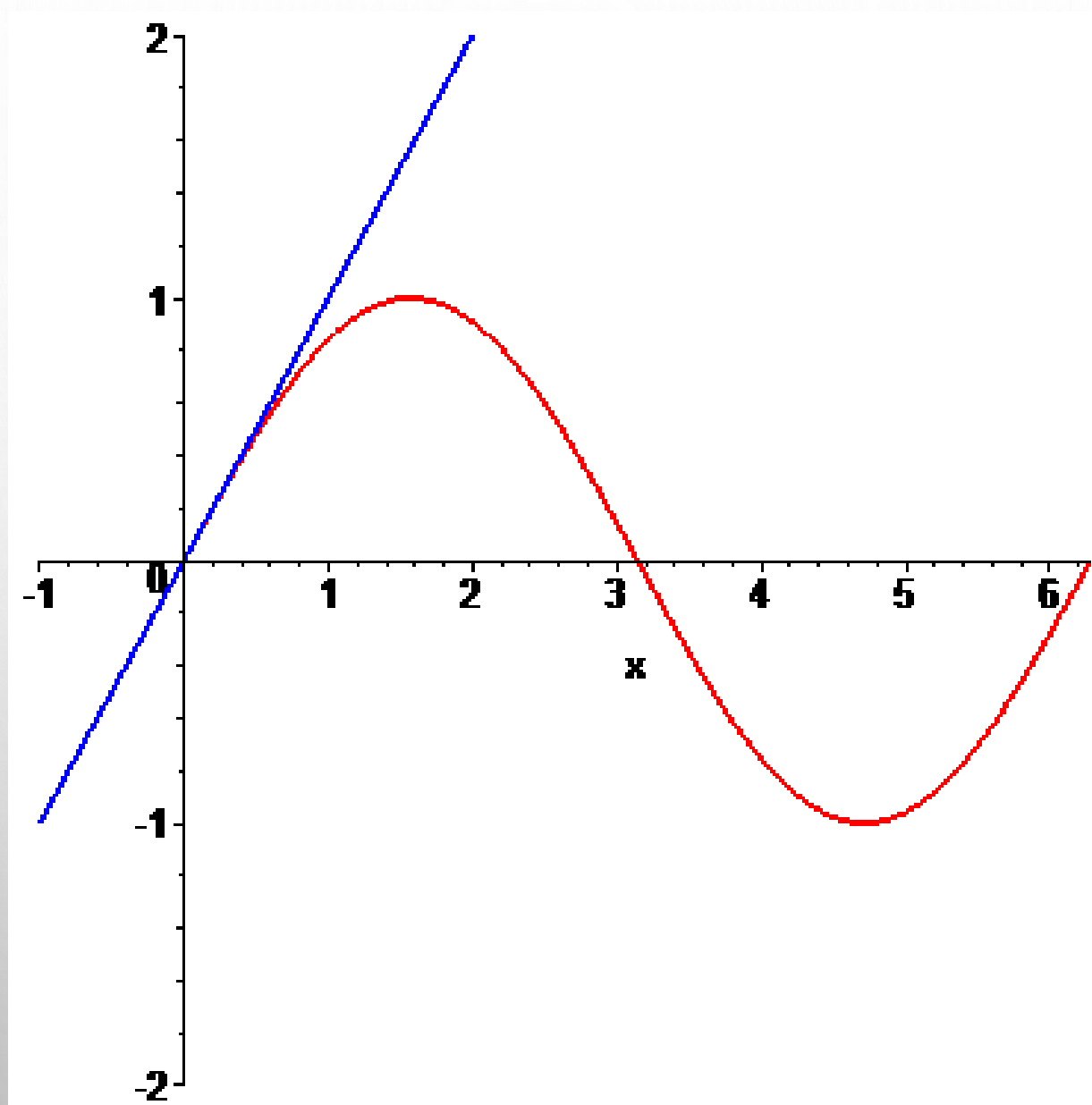
LESSON 2.4

TRIGONOMETRIC DERIVATIVES

TWO IMPORTANT LIMITS

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

$$2. \lim_{\theta \rightarrow 0} \frac{\cos \theta - 1}{\theta} = 0$$



FUNDAMENTALS

$$1. \frac{d}{dx}(\sin x) = \cos x$$

$$2. \frac{d}{dx}(\cos x) = -\sin x$$

$$3. \frac{d}{dx}(\tan x) = \sec^2 x$$

$$4. \frac{d}{dx}(\cot x) = -\operatorname{csc}^2 x$$

$$5. \frac{d}{dx}(\sec x) = \sec x \tan x$$

$$6. \frac{d}{dx}(\operatorname{csc} x) = -\operatorname{csc} x \cot x$$

PROBLEM

Find the derivatives; simplify to a reasonable point.

(a) $y = \sin x \cos x$

(c) $y = x^3 \tan x$

(b) $f(t) = \frac{1 - \sin t}{1 + \sin t}$

(d) $g(\theta) = \csc^2 \theta$