

CALC QUIZZES

DUCHIN

QUIZ 1

Let n equal the number of letters in your first name.

- (1) Is n constant or variable?
- (2) What is the slope of the line through $(1, 1)$ and $(2, n)$?
- (3) Give the equation of a line through $(0, 0)$ and parallel to the line in the previous part.

QUIZ 2

Let m equal your age. For that m , let

$$f(t) = \frac{3t^m}{t^{20} - 1}.$$

- (1) List all asymptotes of $f(t)$.
- (2) List all discontinuities of $f(t)$ and say what type they are (removable, jump, etc).

QUIZ 3

- (1) Sketch the graph of $f(x) = \sin x$.
- (2) Find two points, P and Q , on that graph such that the slope of the secant line between P and Q is zero.
- (3) Is $g(x) = x^{1/3}$ differentiable at all points?

QUIZ 4

Let $f(x) = 5x^2 + 6x$ and $g(x) = \sqrt{2x}$.

- (1) Find $f'(x)$.
- (2) Find $g'(x)$.
- (3) Find the derivative of $h(x) = \frac{5x^2 + 6x}{\sqrt{2x}}$.
- (4) What would you have to check to see whether $h(x)$ is increasing or decreasing when $x = 10$?
- (5) (Extra) Is $h(x)$ increasing or decreasing when $x = 10$?

QUIZ 5

Let $a^2b^3 + 5 \sin(a) = b + 1$.

- (1) Get a new equation by taking d/dt of both sides.
- (2) If a is increasing at 5 units/second at an instant when $a = 0$ and $b = 1$, find the rate of change of b .

QUIZ 6

Let $f(x) = \frac{x^3}{4} - 3x$.

- (1) Find the critical numbers and critical points.
- (2) Classify them as local max / local min / neither.
- (3) Are they *global* extrema?
- (4) (optional) Graph $f(x)$.

QUIZ 7

- (1) Find the minimal possible sum of a positive number and its reciprocal.
- (2) For $g(x) = x + \frac{1}{x}$, when $x > 0$, find the intervals of increasing/decreasing and the concavity.