MAT 122

Example:
Suppose the cost to produce x chairs is given by

$$c(x) = 20\sqrt{x} + 100$$

What is the cost increase per chair when $x = 36$?

$$c'(36) = \lim_{t \to 36} \frac{c(36) - c(t)}{36 - t} = \dots$$

Example:
Suppose the proportion of people you find attractive can be written as a function of the quantity x of alcohol drunk: (in oz)

$$p(x) = \frac{x+1}{x+9}$$

What is the increase in proportion of attractive people per ounce drunk when $x = 1$ oz?

$$p'(1) = \lim_{h \to 0} \frac{p(1+h) - p(1)}{h} = \dots$$

Differentiability

f is said to be differentiable at a if the limit

$$f'(a) = \lim_{t \to a} \frac{f(a) - f(t)}{a - t} \quad \left(\text{or } \lim_{h \to 0} \frac{f(a+h) - f(a)}{h} \right)$$

exists.

Example: $f(x) = |x|$ is not differentiable at 0.

★ f is differentiable where it is continuous and it's graph has no kinks.