

**Practice Test, Math 151**

**Name:** \_\_\_\_\_

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1. Evaluate:            **a.**  $\lim_{x \rightarrow 0} \frac{e^x - 1}{\cos x}$                             **b.**  $\lim_{x \rightarrow \pi} \frac{\sin x}{x - \pi}$
2. Find  $\frac{dy}{dx}$ :            **a.**  $y = \frac{\cos x}{\arctan x}$                             **b.**  $y = \sin(x^2) \cdot e^2$                             **c.**  $y^2x + 3 \sin y = x^2$
3. Write the definition of:  
**a.** the derivative of  $f(x)$  at point  $x = a$   
**b.** the definite integral of  $f(x)$  from  $x = a$  to  $x = b$ .
4. During the first hour, the production rate  $p(t)$  of a concrete factory was measured as follows:

time in minutes	0	15	30	45	60
production rate in lbs/min	8	10	13	17	22

- a.** Estimate  $p'(30)$ , give units, and explain its meaning.  
**b.** Estimate  $\int_0^{60} p(t)dt$ , give units, and explain its meaning.
5. The length plus girth (perimeter) of a rectangular box sent by the US Post Office can be at most 108 inches. Assuming that the base of the box is a square, what is the largest volume box that can be sent by US Post?

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