University of Michigan
Student Name:

Math 115 Quiz 3

Section 9 - Winter 2011
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Note: In Section 2.4, we look for practical interpretations of the derivative aimed at a non-calculus-expert. Please answer the following questions following the pattern indicated in our textbook.

A hot cup of Tim Horton's coffee is brought into a cold arena. Its temperature T, in degrees Celsius, is given by $T = f(t)$, where t is the time in minutes since the cup was brought into the arena.

1. What is the sign of $f'(t)$? Why?

   The sign of $f'(t)$ is negative because the temperature of the coffee $f(t)$ is decreasing after the cup is brought into the arena.

2. What are the units of $f'(20)$? What is the practical meaning of the statement $f'(20) = -0.2$?

   The units of $f'(20)$ are $\frac{\text{units of f}}{\text{units of t}} = \frac{\text{degrees Celsius}}{\text{minute}}$. Following the pattern in the book, we use the tangent line to give an approximation one unit away from our input, so we say that from the 20th to the 21st minute after the cup was brought into the arena its temperature decreased by approximately 0.2 degrees Celsius.