Mathematics 122 Quiz 11 Name: Key

A hot cup of coffee is set down on a table. Let t be the number of minutes since the coffee was put on the table and C the temperature of the coffee in °F. Then C is a function of t, that if $C = f(t)$.

(1) If $f(5) = 90$ then what are the units of 5 and 90?

1 pt

Units of 5 minutes

Units of 90 °F

(2) Do you expect $f'(t)$ to be positive or negative (circle one). Write a sentence explaining why. The coffee is cooling off, and thus $f(t)$ is decreasing.

1 pt

(3) If $f'(5) = -2.5$, then what are the units of -2.5?

1 pt

Units of -2.5 °F/minute

(4) If $f(5) = 90$ and $f'(5) = -2.5$, then estimate $f(5.6)$.

2 pts

$f(5.6) \approx$ 88.5 °F

$f(t) \approx f(a) + f'(a)(t-a)$

In our case $t = 5.6$, $a = 5$, $f(a) = 90$

$f'(a) = -2.5$

$f(5.6) \approx 90 - 2.5(5.6 - 5)$

$= 90 - 2.5(.6)$

$= 88.5$