Mathematics 122

Quiz 22 Name: Key

You must show your work to get full credit.

1. If $f(10) = 20$ and $f'(10) = -.7$

(a) Estimate $f(10.2)$. $\approx f(10) + f'(10)(.2)$
$= 20 - (.7)(.2) = 19.89$ $f(10.2) \approx$ 19.89

(b) Estimate $f(9.1)$. $\approx f(10) + f'(10)(-.9)$
$= 20 + (-.7)(-.9)$
$= 20.63$ $f(9.9) \approx$ 20.63

2. The following table gives the rate that oil is leaking from a storage tank.

t = hours since leak started.	0	.5	1.0	1.5	2.0
Rate in gallons per hour	100	95	85	70	60

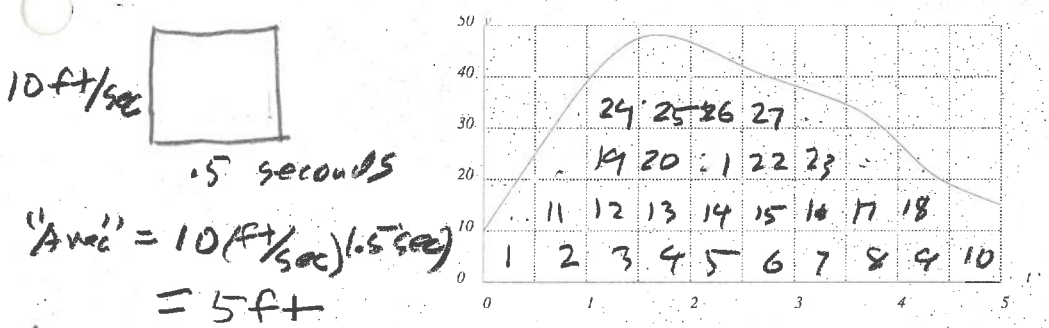
Assume the rate of the leakage is slowing down and compute the following

$.5(100+95+85+70)$ Upper bound for the number of gallons lost 175

$.5(95+85+70+60)$ Lower bound for the number of gallons lost 155

$\frac{1}{2}(175+155)$ The best guess of number of gallons lost 165

3. The following is the graph of velocity in feet per second of a cheetah during a five second period.



(a) Each of the little squares has a base of $\Delta t = .5$ sec and a height of 10 ft/sec. So what does the area of one of the squares represent in terms of distance?

A square represents 5 feet

(b) What is the number of squares between the t axis and the graph (include fractions of squares).

27 full squares
$+.6+.7+.8+.9+.4$
$+.4+.7+.4+.8+.5 = 32.2$

The number of squares is 32.2 (approximately)

(c) Estimate the distance traveled by the cheetah during the five second period.

The distance covered is about $(32.2) \times 5 = 161$ ft.