2003 AB3

3a. R'(45) is approximately equal to $\frac{R(40)-R(50)}{40-50}=1.5\frac{gal/\min}{\min}$

3b. At t = 45 the function R(t) is increasing fastest. After this point the slope of R(t) will decrease. This is the location where R"(t) is changing from positive concavity to negative concavity so R"(t) should be zero.

3c.

$$\int_0^{90} R(t)dt \approx 30(20)+30(10)+40(10)+55(20)+65(20)$$

$$\int_0^{90} R(t)dt \approx 3700gal$$

This value is less than the actual value since all rectangles are under the function or R(t) is increasing for 0<t<90 so the Left hand Riemann Sum is less than the actual area.

3d. $\int_0^{b} R(t)dt =$ is the number of gallons of fuel consumed during the first b minutes of a flight.

$\frac{1}{b}\int_0^{b} R(t)dt =$ average rate of consumption (gallons/minute) of fuel consumed during the first b minutes of the flight.