1. AP Calculus AB 2002 #2 (Calculator allowed)
    a. $\int_9^{17} E(t)\,dt\ =\ 6004.27$ About 6004 people entered the park in total at 5:00pm.
    b. $15*\ \int_9^{17} E(t)\,dt\ +\ 11*\ \int_{17}^{23} E(t)\,dt$ = 15*6004 + 11*1271 = $104,041 collected in entire day.
    $H'(x)\ =\ E(x) -\ L(x)$
    c. $H'(17) = E(17) - L(17)$ = -202690/533
    H(17) means at time 17, there are H(17)= 3725 people in the park
    H’(17) means at time 17, the park is decreasing at a rate of -202690/533 people per hour.
    d. $H'(x)\ =\ 0\,at\,x = 15.795$ At time x= 15.795, the park size is at its maximum.
2. AP Calculus AB 2010 #3 (Calculator allowed)
    a. $\int_0^3 r(t)\,dt\ =\ 3*800\ +\ 2*200\ +\ \frac{400}{2}\ +\ \frac{2*200}{2}\ =\ 3200\,people$
    b. The number of people waiting in line is increasing from time t=2 to t=3. Since r(t) is >800 for all t in the interval (2,3), the rate at which the line moves when the line is full, the line is increasing.
    c. At time t=3, the line is the longest, at 700+ $\int_0^3 r(t)dt = 3200$ - $\int_0^3 800dt =\ 2400$ = 1500 people waiting in line at time t=3. This is because only the interval (0,3) has r(t)>=800. For t>3, r(t)<800.
    d. 700+ $\int_0^t r(x)dx\ -\ 800t$ =0
3. AP Calculus AB 2017 #2 (Calculator allowed)
    a. $\int_0^2 f(t)\,dt =\ 20.05117518089708$
    b. f’(7) = -8.11954. This means that at time t=7, the rate of bananas being taken decreases by 8.11954 per hour.
    c. At time t=5, the number of pounds of bananas on the table is decreasing. This is f(5)-g(5) = -2.2631 < 0, so f(5) > g(5).
    d. At time t=8, there are
    $-\int_0^8 10 + (.8t)\sin\left(t^3/100\right)\ +\ \int_3^8 3 + 2.4\ln\left(t^2+2t\right) + 50$ = 23.34739 pounds of bananas left on the display table.