2017 AB #2
(calculator)

There are 50 pounds of bananas on display when the store opens $(t=0)$.

Customers remove bananas from the display at a rate of $f(t)$ $\frac{\text{pounds}}{\text{hr}}$ for $0<t\le 12$.

Employees add bananas to the display at a rate of $g(t)$ $\frac{\text{pounds}}{\text{hr}}$ for $3<t\le 12$.

(a) $\int_0^2 f(t)\,dt \approx 20.05117518$ pounds or 20.051 pounds are removed during the first 2 hours.
(b) $f'(7)\approx -8.119539823$ or -8.120 or -8.119 Seven hours after the store opens, the rate that the customers remove bananas from the table is decreasing by 8.120 $\frac{\text{pounds}}{\text{hr}^2}$.
(c) $f(5)\approx 13.796$ $\frac{\text{pounds}}{\text{hr}}$ removed $g(5)\approx 11.532$ $\frac{\text{pounds}}{\text{hr}}$ added The number of pounds on the table at $t=5$ is **decreasing** since $f(5)>g(5)$. or consider: Amount of bananas at any time, $A(t)\ =50-\int_0^t f(x)\,dx+\int_3^t g(x)\,dx$ $A'(t)=-f(t)+g(t)$ $A'(5)=-f(5)+g(5)\approx -13.796+11.532<0$ Hence the amount of bananas on the table is decreasing at $t=5$.
(d) Pounds of bananas on table at $t=8$ is the pounds at opening $-$ pounds removed $+$ pounds added $50-\int_0^8 f(t)\,dt+\int_3^8 g(t)\,dt \approx 23.34739574$ pounds or 23.347 pounds