

55 A store finds that its sales revenue changes at a rate given by:

$$S'(t) = -30t^2 + 360t, \quad 0 \leq t \leq 30$$

a) Find the total sales for the first week after an ~~advertising~~ campaign ends. ($t=0$ to $t=7$)
الفترة الأولى أسبوعياً

$$\begin{aligned} S(t) &= \int_0^7 (-30t^2 + 360t) dt \\ &= \left(-\frac{300}{3} t^3 + \frac{360t^2}{2} \right) \Big|_0^7 \\ &= -100t^3 + 180t^2 \Big|_0^7 \\ &= (-100(7)^3 + 180(7)^2) - (0) \\ &= ~~232370~~ 5390 \end{aligned}$$

b) Find the total sales for the second week ($t=7$ to $t=14$)

$$\begin{aligned} S(t) &= \int_7^{14} (-30t^2 + 360t) dt \\ &= \left(-\frac{30}{3} t^3 + \frac{360t^2}{2} \right) \Big|_7^{14} \\ &= \left(-10t^3 + 180t^2 \right) \Big|_7^{14} \\ &= (-10(14)^3 + 180(14)^2) - (-10(7)^3 + 180(7)^2) \end{aligned}$$