Solutions for Homework #4

K= $10,000
c= $4,000
D= 5600 / year
I=0.20

(i) Cycle time = T = Q / D = 200 / 5600 = 2/56 year = 0.035714 years = 1.785714 weeks

(ii)
a) 0.5 weeks = 0.01 years. Since $\tau < T$, we can directly use $R = \tau * D$. Thus

R=(5600)*(0.01) = 56

b) Lead time = τ = 2 weeks = 2/50 year = 0.04 years. Since 0.04 > T = 0.035714 we find the ratio τ / T which is 1.12, taking the decimal part; τ^* = 0.12 * T = 0.004286 years. Thus R= 0.004286 * 5600 = 24 units.

(iii). EOQ model is as follows:

$$Q^* = \sqrt{\frac{2DK}{h}} = \sqrt{\frac{2*5{,}600*10{,}000}{4000*(0.2)}} \cong 375$$

Optimal cycle time T* = Q* / D = 375 / 5600 = 0.067 years = 3.35 weeks

(iv). $TC(Q^*) = TC(375) = \frac{D}{Q^*}K + \frac{Q^*}{2}h = \frac{5600}{375}10{,}000 + \frac{375}{2}800 = \$299{,}333$

TC(Q) = TC(200) = 10000 * (5600/200) + 200 / 2 * 800 = 360000

TC(200) – TC(375) = 360000 – 299333 = 60667