Question 6

The total cost need for this perpetuity is 77.1

$$\Rightarrow P_V = 77.1$$

$$77.1 = v^2 + 2v^3 + 3v^4 - - - + nv^{n+1} + n\cdot v^{n+1} a_{\overline{\infty}|}$$

$$= v(v + 2v^2 + 3v^3 + - - nv^n) + \frac{nv^{n+1}}{r}$$

$$77.1 = v\,(Ia)_{\overline{n}|} + \frac{nv^{n+1}}{r}$$

$$= v\left[\frac{\ddot{a}_{\overline{n}|} - nv^n}{r}\right] + \frac{nv^{n+1}}{r}$$

$$= \frac{a_{\overline{n}|}}{r} - \frac{nv^{n+1}}{r} + \frac{nv^{n+1}}{r}$$

$$= \frac{a_{\overline{n}|}}{r} = \frac{1 - v^n}{r^2} = \frac{1 - v^n}{0.01102}$$

$$1 - v^n = 0.85003$$

$$\Rightarrow 1 - (1.105)^{-n} = 0.85003$$

$$n = -\frac{Ln(0.14997)}{Ln(1.105)} = 19$$