

①



$$N=30$$

$$i=0.035$$

$$(F/P, i, N)?$$

$$(F/P, 0.035, 30) = (1+0.035)^{30}$$

$$= 2.806793705$$

$$F = P(F/P)$$

$$P = F / (F/P)$$

$$= \frac{100\,000}{2.806793705}$$

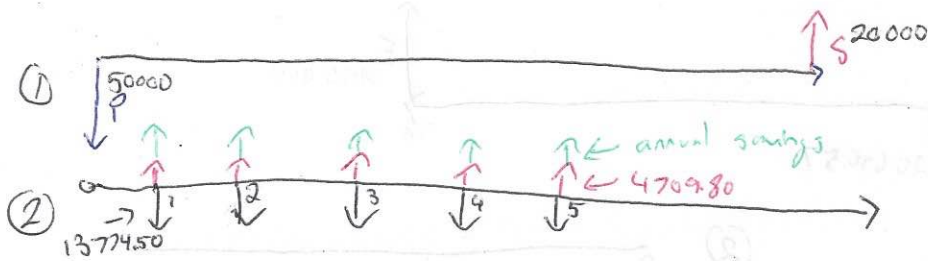
$$= 320650.57$$

② $P = 50000$

$S = 20000$

$i = 0.04$

amount of net annual savings to justify?



i) $(A/P, 0.04, 4) = \frac{0.04(1.04)^4}{1.04^4 - 1} = 0.275490045$

$A = 50000(0.275490045) = \13774.50

ii) $(A/F, 0.04, 4) = \frac{0.04}{(1.04)^4 - 1} = 0.235490045$

$A = 20000 * 0.235490045 = \4709.80

iii) $0 = A_{\text{cost}} + A_{\text{salvage}} + A_{\text{savings}}$

$= -13774.50 + 4709.80 + A_{\text{savings}}$

$A_{\text{savings}} = \$9064.70$

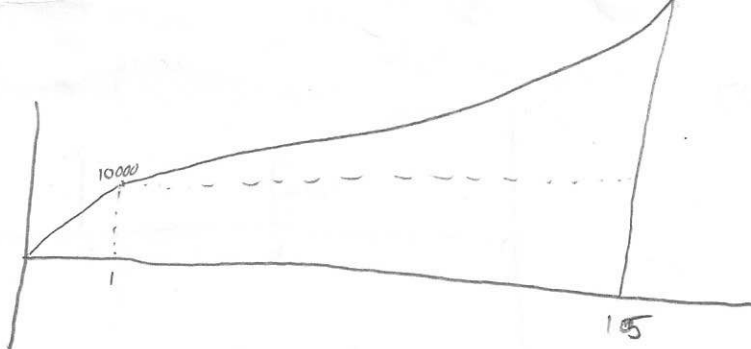
③ $N=15$ $A=10000$

$i=0.10$

$g=0.15$

$$q = \frac{1+0.10}{1+0.15} - 1$$

$q = -0.04347826$

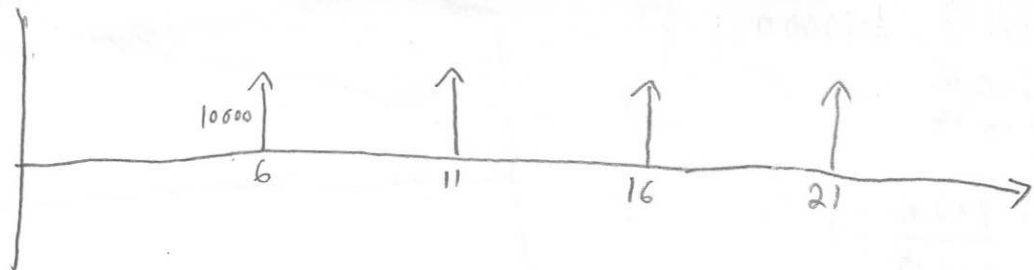


$$P = \left[\frac{(0.956521739)^{15} - 1}{-0.04347826 (0.956521739)^{15} - \frac{1}{1+0.15}} \right] \cdot A$$

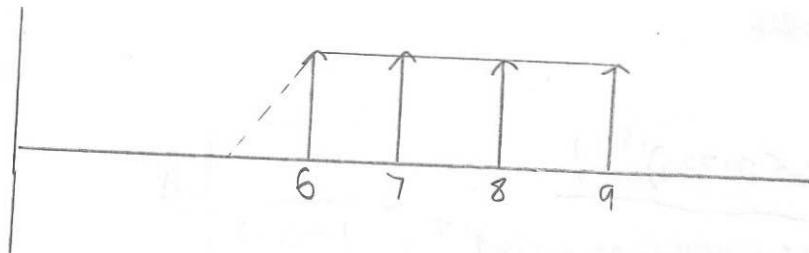
$= 18.95895718 (10000)$

$P = \$189\,589.57$

④ $i = 0.07$



i) $i_e = (1 + 0.07)^5 - 1$
 $= 0.40255173$



$$P_5 = A(P/A, i_e, 4) \cdot \frac{(1 + 0.40255173)^4 - 1}{0.40255173(1 + 0.40255173)^4} = 1.842200494$$

$$= 10000 (1.842200494)$$

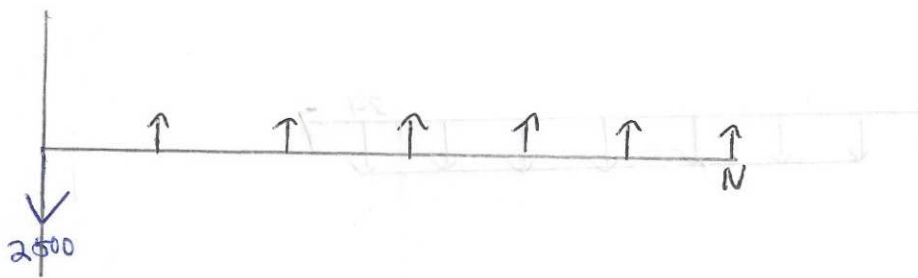
$$= \$18422$$

$$P_0 = F(P/F, i, 5) \cdot \frac{1}{(1 + 0.07)^5} = 0.712986179$$

$$= 18422 (0.712986179)$$

$$= \$13134.63$$

⑤ 2500



$$2500 = A(P/A, i, N), \frac{0.01(1.01)^N - 1}{0.01} = (1.01)^N - 100$$

$$2500 = 30(1.01^N - 100)$$

$$5500 = 1.01^N \cdot 30$$

$$\frac{5500}{30} = 1.01^N$$

$$\log\left(\frac{5500}{30}\right) = N \log 1.01$$

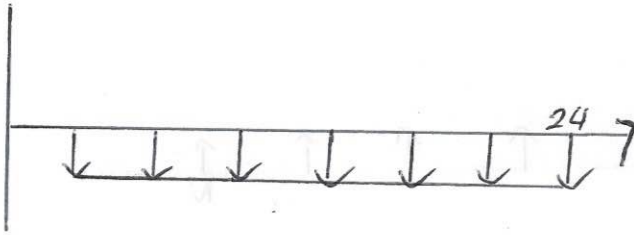
$$N = 523.73, \therefore \text{It would take 524 months}$$

⑥

$$N=24$$

$$P=3350$$

$$i=0.02$$



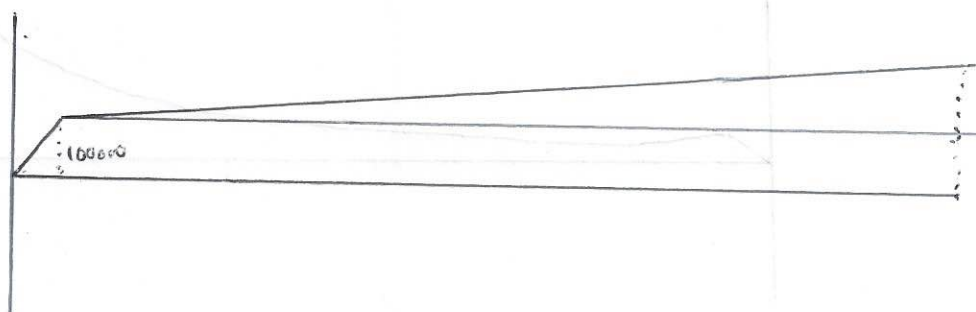
$$A = P(A/P, i, N), \quad \frac{0.02(1+0.02)^{24}}{(1+0.02)^{24} - 1} = 0.052871097$$

$$A = 3350[0.052871097]$$

$$= \$177.12/\text{month}$$

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$$\begin{aligned} N &= 25 \\ A' &= 100\,000 \\ G &= 10\,000 \\ i &= 0.05 \end{aligned}$$



$$i) A = A' + G(A'/G, i, N), \quad \frac{1}{0.05} - \frac{25}{1.05^{25} - 1} = 9.52377135$$

$$A = 100\,000 + 10\,000(9.52377135)$$

$$= 100\,000 + 95\,237.71$$

$$= 195\,237.71$$

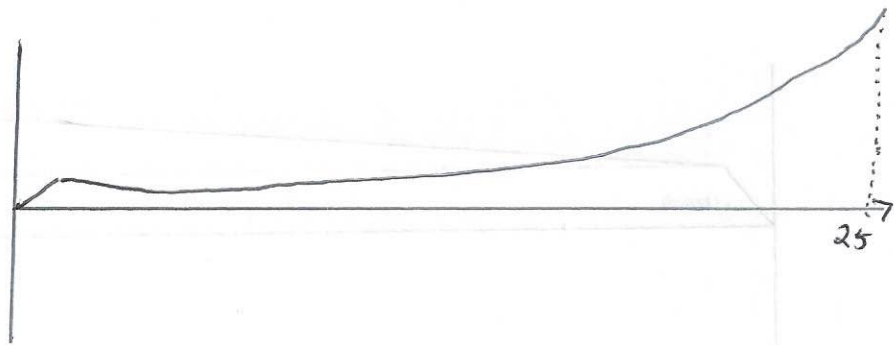
$$P = A(P/A, i, N), \quad \frac{(1.05)^{25} - 1}{0.05(1.05)^{25}} = 14.09394457$$

$$= 195\,237.71 * 14.09394457$$

$$= \$2\,751\,669.51$$

\therefore Ray's offer is not a good deal, as she would lose approximately \$250 000

⑧ $g = 0.1$
 $i = 0.05$
 $N = 25$
 $A' = 100\,000$



$$i = \frac{1.05}{1.1} - 1$$

$$= -0.045$$

$$P = A' (P/A, i, N) = \frac{(1 - 0.045)^{25} - 1}{-0.045(1 - 0.045)^{25}} \cdot \frac{1}{1.1} = 43.99037391$$

$$= 100\,000 (43.99037391)$$

$$= \$4\,399\,037.39$$

∴ Ray's offer is lower than Oriana's lottery winnings, and is therefore not a good deal