BOARD OF STUDIES
NEW SOUTH WALES

(10) $P = \$1000$ $R = 0.06$

(i) After 1 year $= (1000 \times 1.06) - 72$.

(ii) After 2 years $= ((1000 \times 1.06) - 72)1.06 - 72$

$= 1000 \times 1.06^2 - 72 \times 1.06 - 72$

After 3 years

$(1000 \times 1.06^2 - 72 \times 1.06 - 72)1.06 - 72$

$= 1000 \times 1.06^3 - 72 \times 1.06^2 - 72 \times 1.06 - 72$

$\therefore$ After n years.

$B_n = 1000 \times 1.06^n - 72(1.06 + 1.06^2 + \ldots 1.06^{n-1})$

$= 1000 \times 1.06^n - 72 \quad 1.06(1.06^n)$

BOARD OF STUDIES
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(iii) $B_n = 1200 - 200 \times (1.06)^n$

$B_{10} = 1200 - 200 \times (1.06)^{10}$

$= 841.83$

After 11 years $= (841.83 \times 1.06) - 90$

After 12 years $= ((841.83 \times 1.06) - 90)1.06 - 90$

$= 841.83 \times 1.06^2 - 90 \times 1.06 - 90.$

After 13 years $= 841.83 \times 1.06^3 - 90 \times 1.06^2 - 90 \times 1.06$

90

$\therefore$ After n years $= 841.83 \times 1.06^n -$

$90-$

(b) (i) time taken for $= \frac{\text{distance}}{\text{speed}} = \frac{2000}{15}$

In $\triangle FGP$ $\cos\theta = \frac{250}{FP}$

$FP = \frac{250}{\cos\theta}$

Time taken $= \frac{\text{distance}}{\text{speed}}$

$= \frac{\frac{250}{\cos\theta}\ m}{4\ \frac{m}{s}} = \frac{250}{4\cos\theta}$

$\therefore$ Time taken by Claire $= \frac{250}{4\cos\theta} = \frac{125}{2\cos\theta}$

Time taken by bus $= \frac{2000 + GP}{15}$

$\tan\theta = \frac{GP}{FG}$

$GP = \tan\theta \times 250$

$= \frac{2000 + 250\tan\theta}{15}$

(ii) for catch the bus

$\frac{2000 + 250\tan\theta}{15} > \frac{125}{2\cos\theta}$

BOARD OF STUDIES
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(ii) $\dfrac{2000 + 250\tan\theta}{15} - \dfrac{125}{200\cos\theta}$

$\dfrac{4000\cos\theta + 250\sin\theta - 125}{30\cos\theta}$