BOARD OF STUDIES
NEW SOUTH WALES

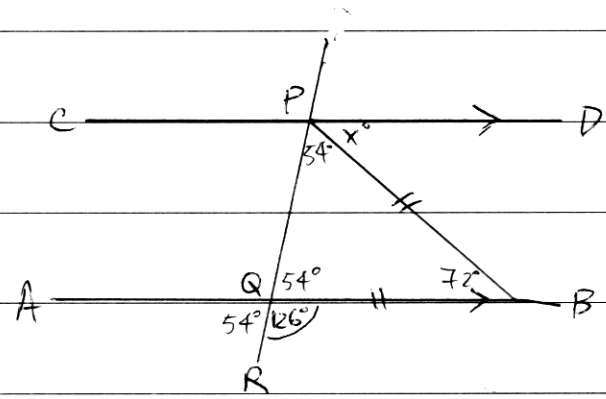
Q. 3.

a) $\text{Invest}_m = P\left(1+\frac{r}{100}\right)^n$

$= 1000\left(1+\frac{3.5}{100}\right)^{20}$

$= \$1989.78$

b)



$\angle AQR = 180° - 126°$ (Sum Angle of a straight line)

$= 54°$

$\angle AQR = \angle PQB = 54°$

(vertically opposite $\angle$'s)

$\angle PQB = \angle BPQ = 54°$ (the bases in an isosceles $\triangle$, opposites are equal. PB = QB (given))

So, $180° - (54° \times 2)$

$= 72°$

$\therefore x = 72°$ (alternate $\angle$'s, CD // AB)

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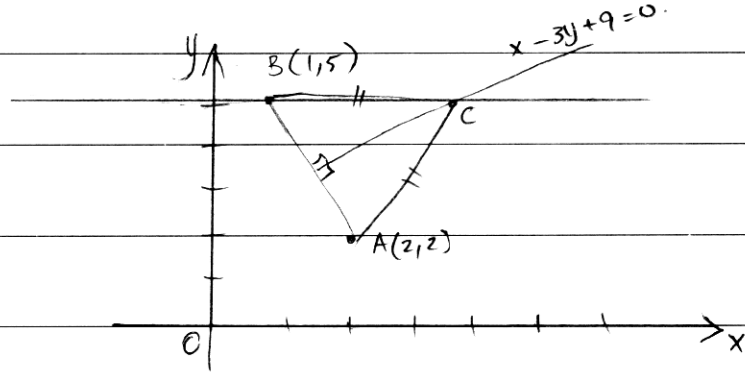
e)



i) midpoint $= \left(\frac{x_2+x_1}{2}, \frac{y_2+y_1}{2}\right)$

$= \left(\frac{2+1}{2}, \frac{5+2}{2}\right)$

$= \left(\frac{3}{2}, \frac{7}{2}\right)$

ii) ~~x - 3y + 9 = 0~~ equation of AB $= y - y_1 = m(x - x_1)$

$m = \frac{y_2 - y_1}{x_2 - x}$

$= \frac{2-5}{2-1}$

$= -3$

$y - 2 = -\frac{1}{3}(x-2)$

$-3y + 6 = x - 2$

$\therefore x + 3y - 8$

Gradient of $x - 3y + 9 = 0$.

$-3y = -x - 9$

$y = \frac{x}{3} - \frac{9}{3}$

$3y = x + 9$

$y = \frac{x}{3} + 3$

$\therefore m = \frac{1}{3}$

~~x~~ $m_1 \times m_2 = -1$

$-3 \times \frac{1}{3} = -1$

$\therefore$ perpendicular bisector is $x - 3y + 9 = 0$

ii) ~~x - 3y + 9 = 0~~ ① $x - 3y = -9$

② $x + 3y = -8$.

① + ②

$2x = -17$

$x = -8\frac{1}{2}$

iv)

v) $\frac{1}{2}ab\sin C$. (Area of triangle)