

(3a)

$$A = P(1+r)^n$$

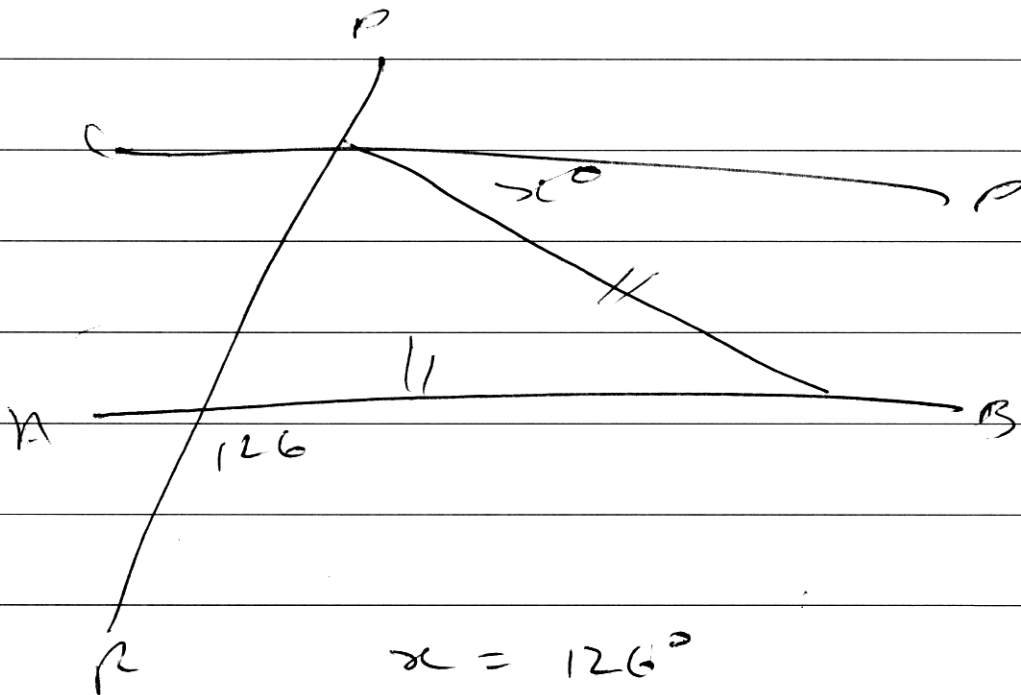
$$= \$1000 \left(1 + \frac{3.5}{100}\right)^{20}$$

$$= 1000(1.035)^{20}$$

$$\therefore A = \$1989.79$$

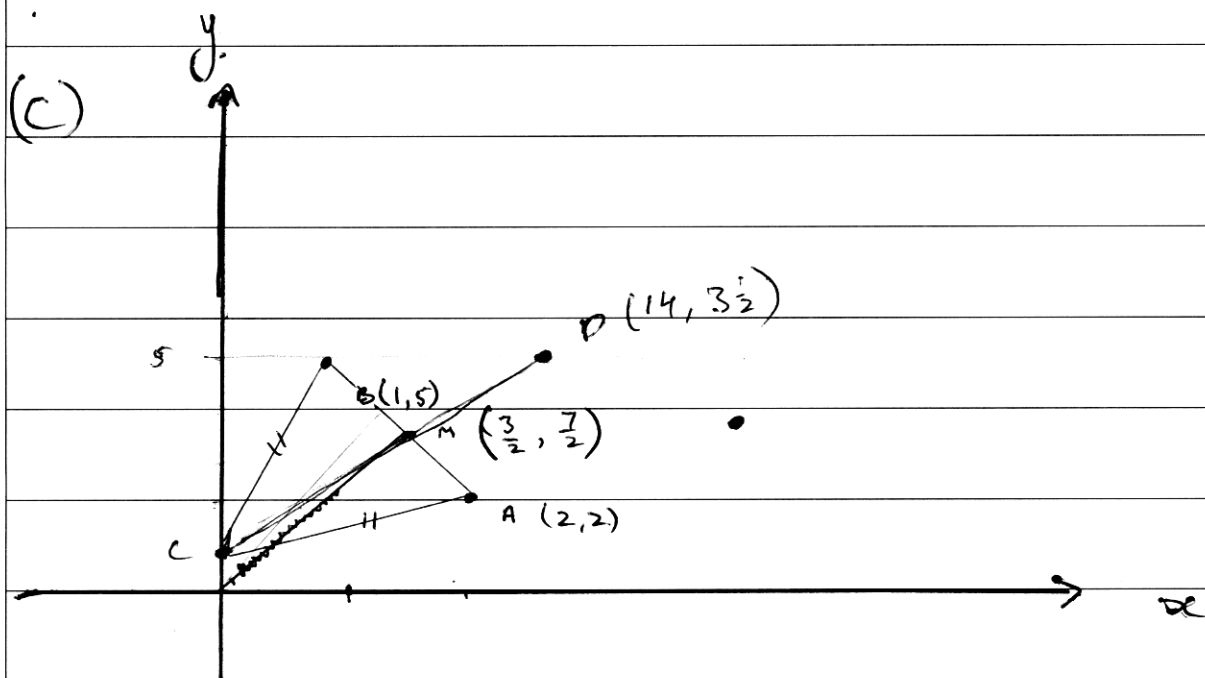
at the end of 20 yrs.

(b)



Parallel lines CD , AB

Sum of outside angles
isosceles triangle



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

$$x = \frac{2 + 1}{2}, y = \frac{2 + 5}{2}$$

$$x = \frac{3}{2}, y = \frac{7}{2}$$

∴ coordinates of midpoint ~~B~~ M are $\left(\frac{3}{2}, \frac{7}{2} \right)$

(ii) EQN. OF PERPENDICULAR BISECTOR

$$\text{Now, gradient of line AB} = \frac{y_2 - y_1}{x_2 - x_1}$$

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

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

∴

$$\therefore \text{gradient of perpendicular bisector} = \frac{1}{3}$$

$$y - y_1 = m(x - x_1)$$

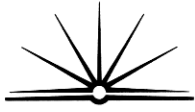
$$y - \frac{7}{2} = \frac{1}{3} \left(x - \frac{3}{2} \right)$$

$$3y - 10\frac{1}{2} = 1 \left(x - \frac{3}{2} \right)$$

$$3y - 10\frac{1}{2} = x - \frac{3}{2}$$
$$+ 10\frac{1}{2} \qquad + 10\frac{1}{2}$$

$$3y = x + 9$$

$$0 = x - 3y + 9$$



iii

~~$x + 3y + 9 = 0$~~
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~~For x value yes~~

~~the coordinates of point C are~~

for y value $x = 0$

$$0 + 3y + 9 = 0$$

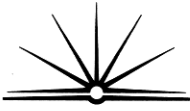
$$\frac{3y}{3} = \frac{-9}{3}$$

$$y = -3$$

∴ coordinates of point C are ~~(0, -3)~~



(0, 3)



(iv) For coordinates of ~~P~~ D solve simultaneously

$$y = 5$$

$$3y = x + 9$$

① $y = 5$ $x = 3$

② $3y = x + 9$ x

$$3y = 15$$

$$3y = x + 9$$

$$= x + 6$$

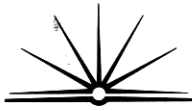
$$x = -6$$

$$3y = -6 + 9$$

$$3y = 3$$

$$y = 1$$

PTD



(ii)

$$y = 5$$

$$x - 3y + 9 = 0$$

By substitution

$$y = 5 = x - 3y + 9$$
$$-9 \qquad -9$$

~~$$y = 5 = x - 3y + 9$$~~
~~$$+5 \qquad +5$$~~
~~$$y = x - 3y + 14$$~~
~~$$-5 \qquad -y$$~~
~~$$0 = x - 4y + 14$$~~

$$y - 14 = x - 3y$$

$$-x + 4y - 14 = 0$$

~~$(14, 3\frac{1}{2})$~~

~~For y value $x = 0$~~

FOR x VALUE $y = 0$

$$-x + 4y - 14 = 0$$

~~$0 - 4y + 14 = 0$~~

$$-x + 0 - 14 = 0$$

~~$4y = 14$~~
 ~~$\frac{4y}{4} = \frac{14}{4}$~~

$$-x = 14$$

$$x = -14$$

~~$y = 3\frac{1}{2}$~~

For y value $x = 0$

~~For value $y = 0$~~

$$-0 + 4y - 14 = 0$$

~~$0 = x - 4(0) + 14$~~

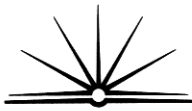
$$\frac{4y}{4} = \frac{14}{4}$$

~~$x = 14$~~

$$y = 3\frac{1}{2}$$

$$x = 14$$

Coordinates of D are $(14, 3\frac{1}{2})$



$$\begin{aligned}\text{Area } \triangle ABD &= \frac{1}{2} BH \\ &= \frac{1}{2} \times \sqrt{10} \times \frac{9}{\sqrt{10}}\end{aligned}$$

$$\text{DIST AB} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(2 - 1)^2 + (2 - 5)^2}$$

$$= \sqrt{(1) + 9}$$

$$= \sqrt{10} \text{ units}$$

$$\therefore \text{area } \triangle ABD$$

$$= 4.5 \text{ units}^2$$

$$\frac{|Ax_1 + By_1 + C|}{\sqrt{a^2 + b^2}}$$

$$\sqrt{a^2 + b^2}$$

$$\left| 1 \times \frac{3}{2} - 3 \times \frac{7}{2} + 9 \right|$$

$$\sqrt{1^2 + (-3)^2}$$

$$\frac{|1 - 9|}{\sqrt{10}}$$

$$\sqrt{10}$$