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NEW SOUTH WALES

Question 3.

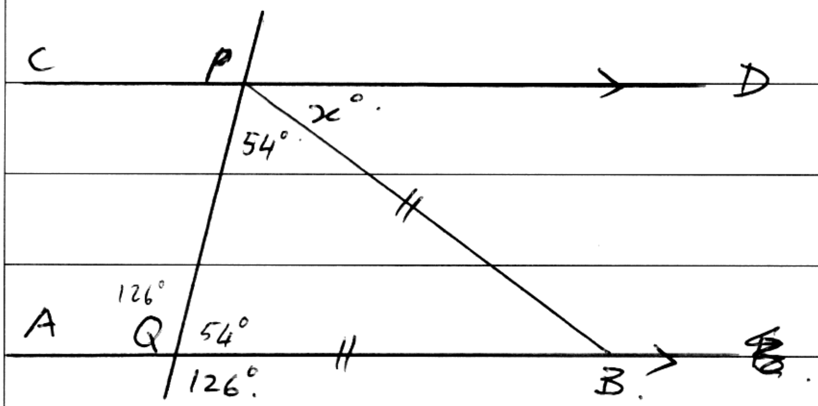
a. $A_n = P\left(1+\frac{r}{100}\right)^n$

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

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

$= \$1989.79$ (2dp).

b.



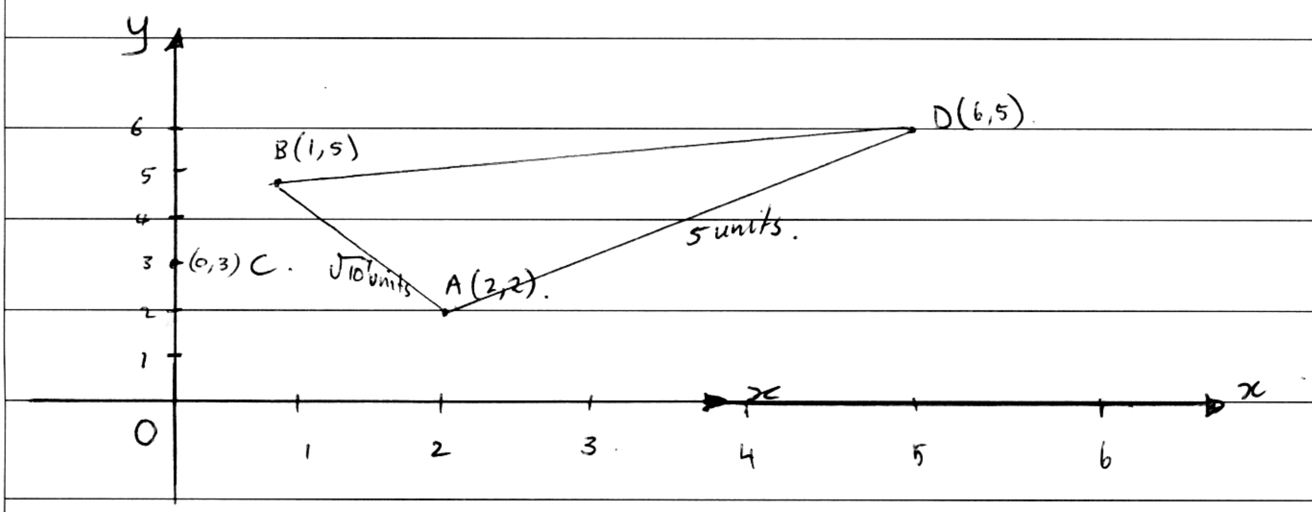

$A\hat{Q}P = 126°$ (vert. opp. ∠'s).

$P\hat{Q}B = 54°$ (∠'s str. line add up to 180° ∴ 180 - 126 = 54°).

$Q\hat{P}B = 54°$ (∠'s of isocoles Δ)

$D\hat{P}B = 72°$ (~~∠'s~~ supplementary ∠'s add up to 180° 180 - 54 - 54 = 72°).

c.



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i. Midpoint $x = \frac{x_1 + x_2}{2}$.

$= \frac{1+2}{2}$.

$= \frac{3}{2}$.

$= 1\frac{1}{2}$.

$y = \frac{y_1 + y_2}{2}$.

$= \frac{5+2}{2}$.

$= \frac{7}{2}$.

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

Midpoint is at $(1\frac{1}{2}, 3\frac{1}{2})$

ii perpendicular bisector. of AB.

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

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

$= \underline{-3}$.

$m_\perp = \frac{1}{3}$

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

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

$y = \frac{1}{3}x + 3$

$3y = x + 9$.

$0 = x + 9 - 3y$.

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iii $x - 3y + 9 = 0$

$x + 9 = 3y$.

@ $x = 0$.

$9 = 3y$

$y = 3$.

$\therefore x = 0$.

Point C lies on $(0,3)$. and is equidistant from A and B.

iv. $y = 5$ and $x - 3y + 9 = 0$.

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

$5 = \frac{1}{3}x + 3$.

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

$x = 6$.

$\therefore y = 5$.

v. Area of $\Delta ABD$.

Area $= \frac{1}{2} b \times h$.

length of AD

$AD = \sqrt{(2-6)^2 + (2-5)^2}$

$= \sqrt{16 + 9}$.

$= \pm\sqrt{25}$

$= \pm 5$ as $-5$ cannot be a length.

$= 5$ units.

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length of AB.

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

$= \sqrt{1 + 9}$.

$= \sqrt{10}$.

$A = \frac{1}{2} \times b \times h$.

$= \frac{1}{2} \times \sqrt{10} \times 5$.

$= 7.9$ units$^2$.