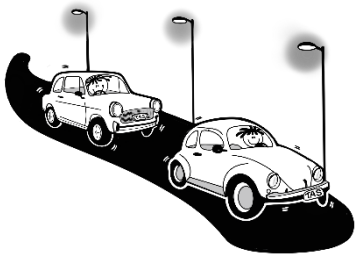
2026 DBE NSC Maths P2 Suggested Memo for TAS-AMESA Exam Review

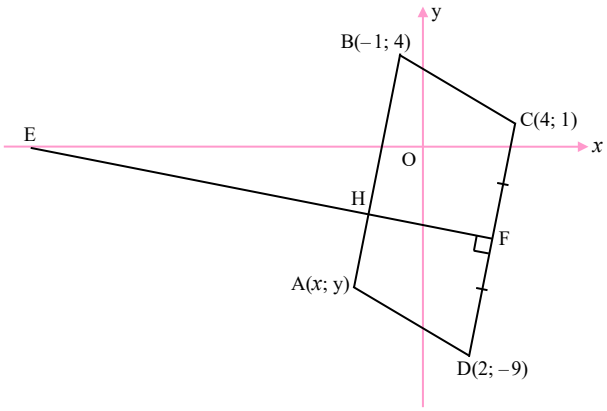
<table>
<tr><td colspan="2">QUESTION 1</td><td></td></tr>
<tr><td>1.1</td><td>50</td><td>(1)</td></tr>
<tr><td>1.2</td><td>64 km / h</td><td>(1)</td></tr>
<tr><td>1.3</td><td>$50-20=30$</td><td>(1)</td></tr>
<tr><td>1.4</td><td><table><tr><th>Speed (in km/h)</th><th>Frequency</th></tr><tr><td>$20 \le t < 40$</td><td>8</td></tr><tr><td>$40 \le t < 60$</td><td>12</td></tr><tr><td>$60 \le t < 80$</td><td>24</td></tr><tr><td>$80 \le t < 100$</td><td>6</td></tr></table></td><td>(2)</td></tr>
<tr><td>1.5</td><td>$\text{Ave speed} = \frac{8\times 30+12\times 50+24\times 70+6\times 90}{50}$
$= \frac{3060}{50}$
$= 61,2 \text{ km/h}$</td><td>(3)</td></tr>
<tr><td></td><td></td><td>[8]</td></tr>
</table>



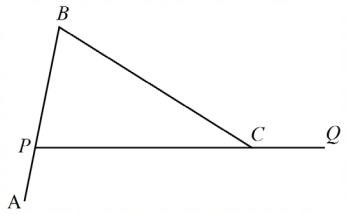
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QUESTION 2		
2.1.1	Scatter plot	(3)
2.1.2	$A = 79,94$ $B = -4,11$ $\therefore y = 79,94 - 4,11x$	(3)
2.1.3	$\therefore y = 79,94 - 4,11(7)$ $= 51,17\%$	(2)
2.1.4	$\sigma = 16,20$	(1)
2.2	$100;\ 98;\ 98(0,98);...$ $100(0,98)^{n-1} = 54,55$ $\therefore (0,98)^{n-1} = 0,5455$ $\therefore n-1 = \log_{0,98} 0,5455$ $\therefore n-1 = 29,998577...$ $\therefore n = 30,998577...$ $\therefore$ the battery will last for 31 months.	(4)
		[13]



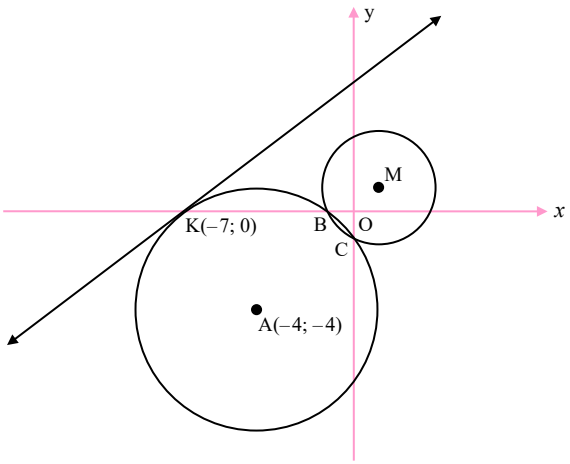
QUESTION 3		
		
3.1	$m_{CD} = \dfrac{1+9}{4-2} = 5$	(2)
3.2	$F = \left(\dfrac{4+2}{2}; \dfrac{1-9}{2}\right) = (3;-4)$	(2)

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3.3	$m_{EF} = -\frac{1}{5}$ $\therefore y+4 = -\frac{1}{5}(x-3)$ $\therefore y+4 = -\frac{1}{5}x+\frac{3}{5}$ $\therefore y = -\frac{1}{5}x-\frac{17}{5}$ $-\frac{1}{5}x-\frac{17}{5}=0$ $\therefore -\frac{1}{5}x = \frac{17}{5}$ $\therefore x = -17$ $\therefore E(-17;0)$	(3)
3.4	$CD = \sqrt{(4-2)^2+(1+9)^2} = 2\sqrt{26}$ $EF = \sqrt{(-17-3)^2+(0+4)^2} = 4\sqrt{26}$ $\therefore Area = \frac{1}{2}(2\sqrt{26})(4\sqrt{26})$ $= 104 \text{ units}^2$	(4)
3.5	$m_{AB} = 5$ (opp sides of parm) $\therefore B\hat{P}C = 78,69°$ $m_{BC} = \frac{4-1}{-1-4} = -\frac{3}{5}$ $\therefore B\hat{C}Q = 149,04°$ $\therefore A\hat{B}C = 70,35°$ (ext $\angle$ of Δ) 	(4)
3.6	$A(-3;-6)$ Midpoint of AE $= \left(\frac{-17-3}{2};\frac{0-6}{2}\right) = (-10;-3)$ $r = \sqrt{(-17+10)^2+(0+3)^2} = \sqrt{58}$ $E\hat{H}A = 90°$ (corresp $\angle$s; AB||DC) $\therefore$ EA is a diameter of the circle passing through E, H and A. (conv $\angle$ in semi circle) $\therefore (x+10)^2+(y+3)^2 = 58$	(6)
		[21]

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QUESTION 4

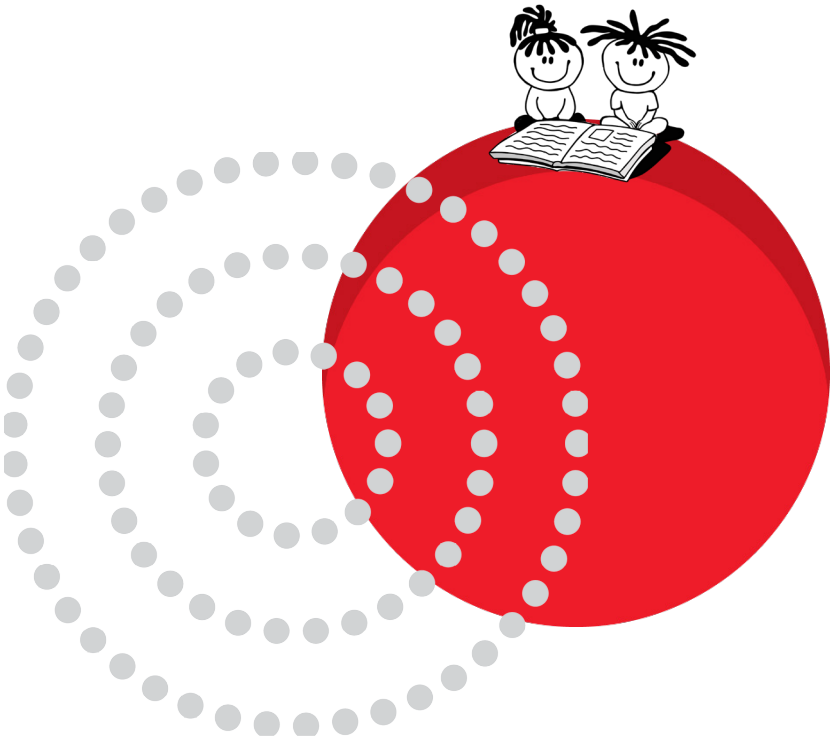




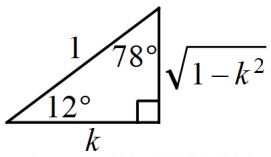
4.1	$AK=\sqrt{(-4+7)^2+(-4-0)^2}=5$ $\therefore (x+4)^2+(y+4)^2=25$	(1)
4.2	$m_{AK}=\dfrac{-4-0}{-4+7}=-\dfrac{4}{3}$	(1)
4.3	$m_{\tan}=\dfrac{3}{4}$ $\therefore y-0=\dfrac{3}{4}(x+7)$ $\therefore y=\dfrac{3}{4}x+\dfrac{21}{4}$	(3)
4.4	$x^2+y^2-2x-2y-3=0$ $\therefore (x-1)^2+(y-1)^2=3+1+1$ $\therefore (x-1)^2+(y-1)^2=5$ $\therefore M(1;1)$	(3)
4.5	$r=\sqrt{5}$	(1)
4.6	$x^2+(0)^2-2x-2(0)-3=0$ $\therefore x^2-2x-3=0$ $\therefore (x-3)(x+1)=0$ $\therefore x=3$ or $x=-1$ $\therefore B(-1;0)$ $\therefore T(-1;-8)$	$(x+4)^2+(0+4)^2=25$ $\therefore x^2+8x+16+16=25$ $\therefore x^2+8x+7=0$ $\therefore (x+7)(x+1)=0$ $\therefore x=-7$ or $x=-1$ $\therefore B(-1;0)$ $\therefore T(-1;-8)$ (4)
4.7	$m_{AT}=\dfrac{-4+8}{-4+1}=-\dfrac{4}{3}$ $\therefore$ K, A and T are collinear ($m_{AK}=m_{AT}$)	(2)

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4.8	$AM = \sqrt{(-4-1)^2 + (-4-1)^2} = 5\sqrt{2}$ $r_{circle\ A} = 5$ $\therefore r_{circle\ M} = 5\sqrt{2} - 5$ $\therefore$ percentage decrease $= \dfrac{\sqrt{5} - (5\sqrt{2} - 5)}{\sqrt{5}} = 7,38\%$ Or $AM = \sqrt{(-4-1)^2 + (-4-1)^2} = 5\sqrt{2}$ $r_{circle\ A} = 5$ $\therefore r_{circle\ M} = 5\sqrt{2} - 5$ $\therefore \dfrac{\text{new radius}}{\text{original radius}} = \dfrac{5\sqrt{2} - 5}{\sqrt{5}} = 92,62\%$ $\therefore$ radius must reduce by $7,38\%$	(5)
		[20]

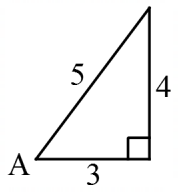


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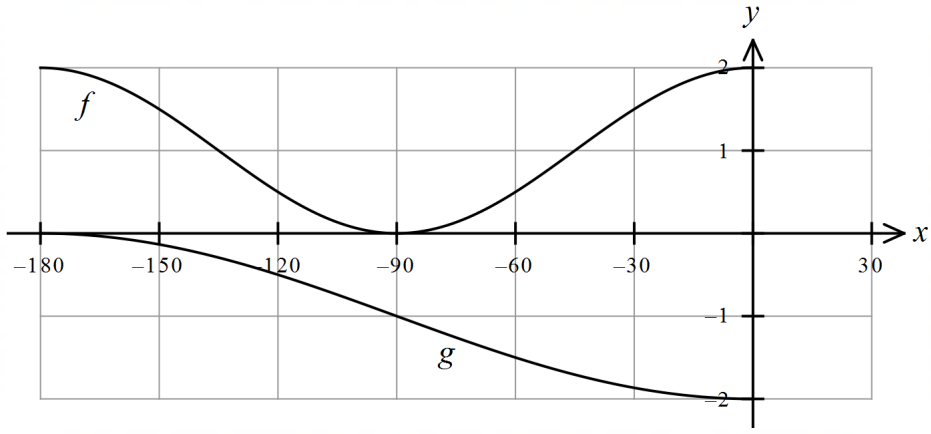
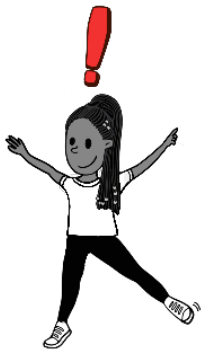
QUESTION 5		
5.1.1	$\sin 12° = \sqrt{1-k^2}$ 	(2)
5.1.2	$\tan(-12°) = -\tan 12°$ $= -\dfrac{\sqrt{1-k^2}}{k}$	(2)
5.1.3	$1-2\sin^2 39° = \cos(2\times 39°)$ $= \cos 78°$ $= \sqrt{1-k^2}$ $1-2\sin^2 39° = \cos(2\times 39°)$ $= \cos 78°$ $= \sin 12°$ $= \sqrt{1-k^2}$	(2)
5.2	LHS $= \dfrac{\sin(90°-\theta)\cos^2(360°-\theta)+\sin^2\theta\sin(180°+\theta)}{\cos\theta+\sin(360°-\theta)}$ $= \dfrac{\cos\theta\cos^2\theta+\sin^2\theta.-\sin\theta}{\cos\theta-\sin\theta}$ $= \dfrac{\cos^3\theta-\sin^3\theta}{\cos\theta-\sin\theta}$ $= \dfrac{(\cos\theta-\sin\theta)(\cos^2\theta+\cos\theta\sin\theta+\sin^2\theta)}{\cos\theta-\sin\theta}$ $= \cos^2\theta+\cos\theta\sin\theta+\sin^2\theta$ $= 1+\cos\theta\sin\theta$ $=$ RHS 	(6)
5.3	Undefined when $\sin\theta-\cos\theta=0$ $\therefore \sin\theta=\cos\theta$ $\therefore \tan\theta=1$ $\therefore \theta=45°+k180°$ $\therefore \theta=225°$	(3)
		[15]

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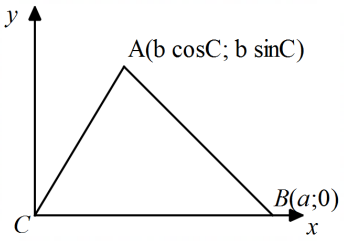
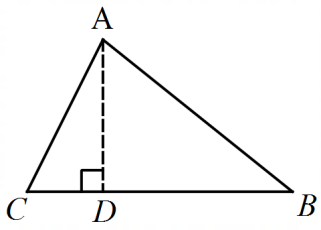
QUESTION 6		
6.1.1	$\cos 25° = \cos(35° - 10°) = \cos 35° \cos 10° + \sin 35° \sin 10°$	(2)
6.1.2	$\cos 25° - 2\sin 10° \sin 35°$ $= \cos 35° \cos 10° + \sin 35° \sin 10° - 2\sin 10° \sin 35°$ $= \cos 35° \cos 10° - \sin 35° \sin 10°$ $= \cos(35° + 10°)$ $= \cos 45°$ $= \frac{1}{\sqrt{2}}$	(3)
6.2	LHS $= 4\sin\theta \cos\theta(\cos^2\theta - \sin^2\theta)$ $= 2(2\sin\theta\cos\theta)(\cos^2\theta - \sin^2\theta)$ $= 2\sin 2\theta \cos 2\theta$ $= \sin 4\theta$ = RHS	(3)
6.3.1	$A = 53{,}13°$	(1)
6.3.2	$4\cos x - 3\sin x = 1$ $\therefore \frac{4}{5}\cos x - \frac{3}{5}\sin x = \frac{1}{5}$ $\therefore \sin A \cos x - \cos A \sin x = \frac{1}{5}$ $\therefore \sin(A - x) = \frac{1}{5}$ $\therefore \sin(53{,}13° - x) = \frac{1}{5}$ $\therefore 53{,}13° - x = 11{,}54° + k\,360°$ or $53{,}13° - x = 180° - 11{,}54° + k\,360°$ $\therefore x = 41{,}59° + k\,360°$ or $x = -115{,}33° + k\,360°;\ k \in \mathbb{Z}$ Or $(4\cos x - 3\sin x)^2 = 1^2$ $\therefore 16\cos^2 x - 24\cos x \sin x + 9\sin^2 x = \sin^2 x + \cos^2 x$ $\therefore 15\cos^2 x - 24\cos x \sin x + 8\sin^2 x = 0 \quad \ldots \div \cos^2 x$ $\therefore 15 - 24\tan x + 8\tan^2 x = 0$ $\therefore \tan x = 2{,}11$ or $\tan x = 0{,}89$ $\therefore x = 64{,}67° + k\,180°$ or $x = 41{,}59° + k\,180°$ $\therefore x = 244{,}67° + k\,360°$ or $x = 41{,}59° + k\,360°;\ k \in \mathbb{Z}$ Can also square both sides in: $4\cos x = 3\sin x + 1$ or $3\sin x = 4\cos x - 1$ Check solutions to remove extraneous roots.	(6)
		[15]

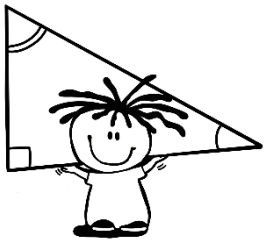


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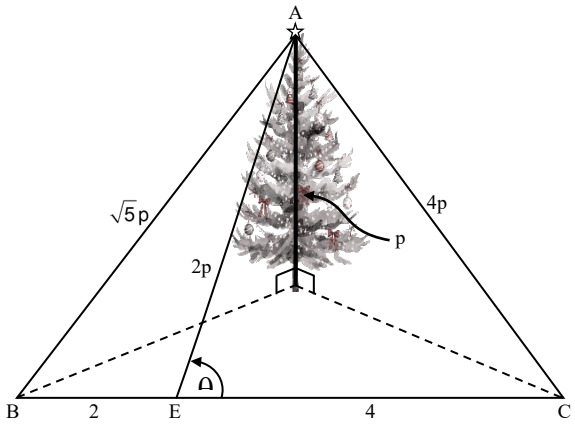
QUESTION 7		
7.1	$0 \le y \le 2$	(1)
7.2	$180°$	(1)
7.3		(3)
7.4.1	$AB = (\cos 2x + 1) - (-\cos x - 1)$ $= \cos 2x + 1 + \cos x + 1$ $= 2\cos^2 x - 1 + 1 + \cos x + 1$ $= 2\cos^2 x + \cos x + 1$	(2)
7.4.2	$2\cos^2 x + \cos x + 1$ $= 2\left(\cos^2 x + \frac{1}{2}\cos x + \frac{1}{2}\right)$ $= 2\left[\left(\cos x + \frac{1}{4}\right)^2 + \frac{7}{16}\right]$ $= 2\left(\cos x + \frac{1}{4}\right)^2 + \frac{7}{8}$ $\therefore$ minimum distance $= \frac{7}{8}$  Or $\cos x = -\frac{b}{2a} = -\frac{1}{2(2)} = -\frac{1}{4}$ $\therefore AB = 2\left(-\frac{1}{4}\right)^2 + \left(-\frac{1}{4}\right) + 1 = \frac{7}{8}$ Or (for FS candidates): $\frac{d(AB)}{dx} = 4\cos x. - \sin x - \sin x = 0$ $\therefore -\sin x(4\cos x + 1) = 0$ $\therefore \cos x = -\frac{1}{4}$ $\therefore AB = 2\left(-\frac{1}{4}\right)^2 + \left(-\frac{1}{4}\right) + 1 = \frac{7}{8}$	(2)
		[9]

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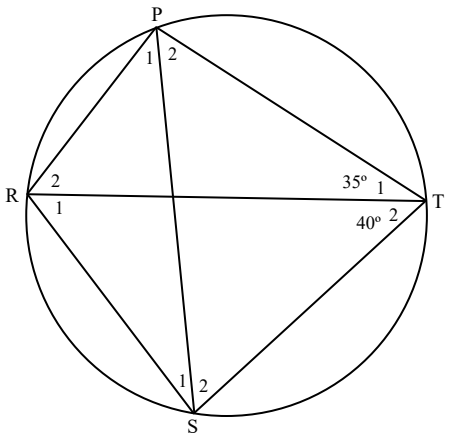
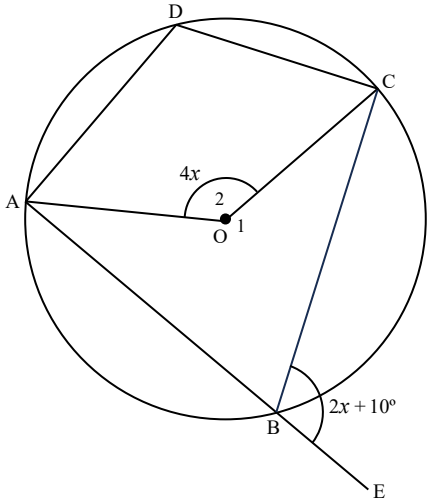
QUESTION 8		
8.1	$AB^2 = (b\cos C - a)^2 + (b\sin C - 0)^2$ $\therefore c^2 = b^2\cos^2 C - 2ab\cos C + a^2 + b^2\sin^2 C$ $\therefore c^2 = a^2 + b^2(\cos^2 C + \sin^2 C) - 2ab\cos C$ $\therefore c^2 = a^2 + b^2(1) - 2ab\cos C$ $\therefore c^2 = a^2 + b^2 - 2ab\cos C$ Or $c^2 = AD^2 + DB^2$ (Pythag) $\therefore c^2 = AD^2 + (a - CD)^2$ $\therefore c^2 = AD^2 + a^2 - 2aCD + CD^2$ $\therefore c^2 = a^2 + b^2 - 2aCD$ (Pythag) $\cos C = \frac{CD}{b}$ $\therefore CD = b\cos C$ $\therefore c^2 = a^2 + b^2 - 2ab\cos C$	 	(4)



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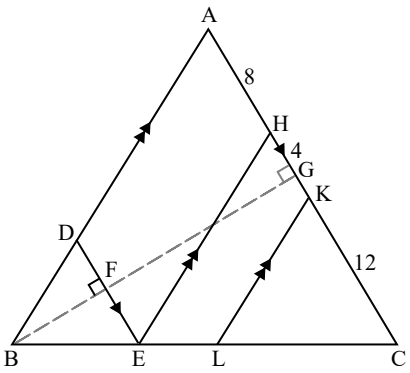
8.2.1	$\cos\theta = \frac{(2p)^2 + 4^2 - (4p)^2}{2(2p)(4)}$ $= \frac{4p^2 + 16 - 16p^2}{16p}$ $= \frac{16 - 12p^2}{16p}$ $= \frac{4 - 3p^2}{4p}$  	(2)
8.2.2	$B\hat{E}A = 180° - \theta$ (∠s on a str line) $\cos(180° - \theta) = \frac{(2p)^2 + 2^2 - (\sqrt{5}p)^2}{2(2p)(2)}$ $\therefore -\cos\theta = \frac{4p^2 + 4 - 5p^2}{8p}$ $\therefore -\cos\theta = \frac{-p^2 + 4}{8p}$ $\therefore \cos\theta = \frac{p^2 - 4}{8p}$ $\therefore \frac{p^2 - 4}{8p} = \frac{4 - 3p^2}{4p}$ $\therefore 4p^3 - 16p = 32p - 24p^3$ $\therefore 28p^3 - 48p = 0$ $\therefore 4p(7p^2 - 12) = 0$ $\therefore p \neq 0$ or $p^2 = \frac{12}{7}$ $\therefore p = 1{,}31$ metres	(5)
		[11]

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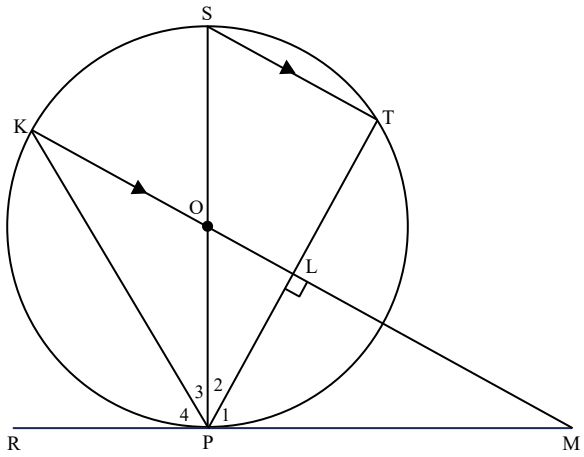
QUESTION 9		
9.1		
9.1.1	$\hat{P}_1 = 40°$ ($\angle$s in the same seg)	(2)
9.1.2	$P\hat{R}S = 105°$ (opp $\angle$s of cyc quad)	(2)
9.2	 $A\hat{B}C = 2x$ ($\angle$ at centre = 2 × $\angle$ at circum) $\therefore 2x + 2x + 10° = 180°$ ($\angle$s on a str line) $\therefore 4x = 170°$ $\therefore x = 42\frac{1}{2}°$ $\therefore A\hat{B}C = 85°$ $\therefore \hat{D} = 95°$ (opp $\angle$s of cyc quad)	(6)
		[10]

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QUESTION 10		
10.1	$\frac{CK}{KH}=\frac{CL}{LE}$ (prop thm; KL||HE) $\therefore \frac{12}{KH}=\frac{3}{1}$ $\therefore KH=4$ cm	(3)
10.2	$\frac{CH}{HA}=\frac{CE}{EB}=\frac{4}{2}=2$ (prop thm; EH||BA) $\therefore HA=8$ cm $\therefore DE=8$ cm (opp sides of parm) $\frac{BF}{FG}=\frac{2}{4}=\frac{1}{2}$ (prop thm; FE||GC) $\therefore FG=2BF$ $\frac{\text{Area of } \Delta BDE}{\text{Area of } DECA}=\frac{\frac{1}{2}\times DE\times BF}{\frac{1}{2}\times(DE+AC)\times FG}$ $=\frac{\frac{1}{2}\times 8\times BF}{\frac{1}{2}\times(8+24)\times 2BF}$ $=\frac{1}{8}$ Or $\frac{BD}{BA}=\frac{2}{6}=\frac{1}{3}$ (prop thm; DE||AC) $\frac{\text{Area of } \Delta BDE}{\text{Area of } \Delta BAC}=\frac{\frac{1}{2}\times BD\times BE\times\sin B}{\frac{1}{2}\times BA\times BC\times\sin B}$ $=\frac{BD}{BA}\times\frac{BE}{BC}$ $=\frac{1}{3}\times\frac{1}{3}$ $=\frac{1}{9}$ $\therefore \frac{\text{Area of } \Delta BDE}{\text{Area of } DECA}=\frac{1}{8}$ (If ΔBDE is 1 part and ΔBAC is 9 parts, then $DECA$ is 9 – 1 = 8 parts)	(4)
		[7]

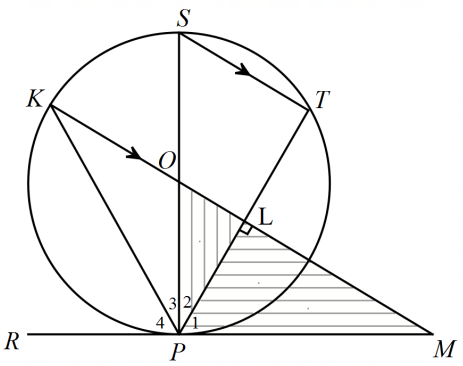


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QUESTION 11		
11.1	BW	(6)
11.2		
11.2.1	Line from centre perp to chord Or PO = OS (radii) and OL||ST $\therefore$ TL = LP (line through midpt || to 2nd side)	(1)
11.2.2	$O\hat{P}M = 90°$ (tan $\perp$ rad) In ΔPML and ΔOMP 1. $\hat{M}$ is common 2. $P\hat{L}M = O\hat{P}M$ (proved above) $\therefore \Delta PML \,\|\|\|\, \Delta OMP$ (AAA)	(4)
11.2.3	$\frac{ML}{MP} = \frac{PL}{OP}$ ($\Delta PML \,\|\|\|\, \Delta OMP$) $\therefore \frac{ML}{MP} = \frac{\frac{1}{2}PT}{\frac{1}{2}SP}$ $\therefore \frac{ML}{MP} = \frac{PT}{SP}$ $\therefore ML.SP = PT.MP$ $\therefore \frac{PT}{ML} = \frac{SP}{MP}$	In ΔPTS and ΔMLP 1. $\hat{P}_1 = \hat{S}$ (tan chord thm) 2. $\hat{T} = 90°$ ($\angle$ in semi-circle) $\therefore \hat{T} = M\hat{L}P$ $\therefore \Delta PTS \,\|\|\|\, \Delta MLP$ (AAA) $\therefore \frac{PT}{ML} = \frac{PS}{MP}$ ($\Delta PTS \,\|\|\|\, \Delta MLP$)	(5)

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11.2.4	**Option 1:**



In ΔOPL and ΔPML

1. $\hat{P}_1 = \hat{S}$ (tan chord thm)

   $= P\hat{O}L$ (corresp ∠s; ST || OL)

2. $O\hat{L}P = P\hat{L}M$

$\therefore \Delta OPL \,|||\, \Delta PML$ (AAA)

$\therefore \dfrac{PL}{ML} = \dfrac{OL}{PL}$ $(\Delta OPL \,|||\, \Delta PML)$

$\therefore PL^2 = ML.OL$

But $PT = 2PL$

$\therefore PT^2 = 4PL^2 = 4ML.OL$

$\dfrac{PM}{OM} = \dfrac{ML}{MP}$ $(\Delta PML \,|||\, \Delta OMP)$ … from 11.2.2

$\therefore MP^2 = OM.ML$

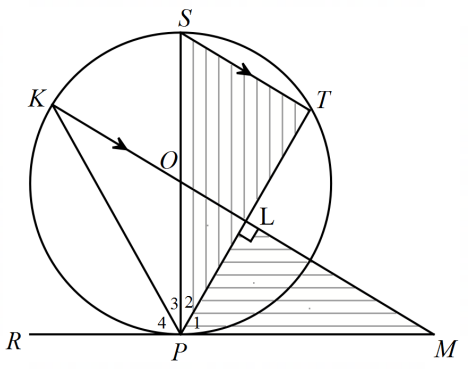
$\therefore \dfrac{MP^2}{PT^2} = \dfrac{OM.ML}{4ML.OL} = \dfrac{OM}{4OL}$

$\therefore \dfrac{MP}{PT} = \dfrac{1}{2}\sqrt{\dfrac{OM}{OL}}$

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Option 2:

$ST = 2OL$ (midpt thm)



In ΔPTS and ΔMLP

1. $\hat{P}_1 = \hat{S}$ (tan chord thm)
2. $\hat{T} = 90°$ ($\angle$ in semi-circle)

   $\therefore \hat{T} = M\hat{L}P$

$\therefore \Delta PTS \,|||\, \Delta MLP$ (AAA)

$$\therefore \frac{PT}{ML} = \frac{TS}{LP} \quad (\Delta PTS \,|||\, \Delta MLP)$$

$$\therefore \frac{PT}{ML} = \frac{2OL}{\frac{1}{2}PT}$$

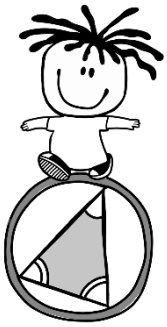
$$\therefore PT^2 = 4ML.OL$$

$$\frac{PM}{OM} = \frac{ML}{MP} \quad (\Delta PML \,|||\, \Delta OMP) \qquad \ldots \text{ from 11.2.2}$$

$$\therefore MP^2 = OM.ML$$

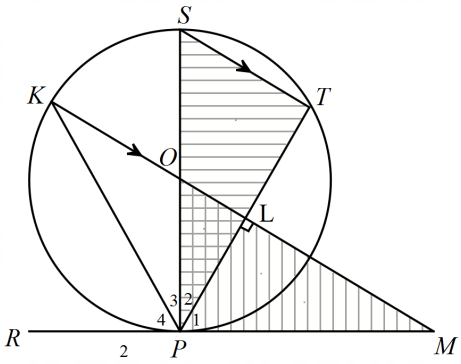
$$\therefore \frac{MP^2}{PT^2} = \frac{OM.ML}{4ML.OL} = \frac{OM}{4OL}$$

$$\therefore \frac{MP}{PT} = \frac{1}{2}\sqrt{\frac{OM}{OL}}$$



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Option 3:



$ST = 2OL$ (midpt thm)

$\hat{T} = 90°$ ($\angle$ in semi-circle)

In ΔOPM and ΔSTP

1. $O\hat{P}M = S\hat{T}P$ (proved)
2. $P\hat{O}M = \hat{S}$ (corresp $\angle$s; ST || OL)

$\therefore \Delta OPM \,|||\, \Delta STP$ (AAA)

$$\frac{PM}{TP} = \frac{OP}{ST} \quad (\Delta OPM \,|||\, \Delta STP)$$

$$\therefore \frac{PM}{TP} = \frac{OP}{2OL}$$

$$\frac{PM}{OM} = \frac{ML}{MP} \quad (\Delta PML \,|||\, \Delta OMP) \qquad \ldots \text{ from 11.2.2}$$

$$\therefore MP^2 = OM.ML$$

In ΔOPM

$OM^2 = PO^2 + MP^2$ (Pythag)

$$\therefore OP = \sqrt{OM^2 - MP^2}$$

$$\therefore OP = \sqrt{OM^2 - ML.OM}$$

$$\therefore OP = \sqrt{OM\left(OM - ML\right)}$$

$$\therefore OP = \sqrt{OM.OL}$$

$$\frac{PM}{TP} = \frac{OP}{2OL}$$

$$\therefore \frac{PM}{TP} = \frac{\sqrt{OM.OL}}{2OL}$$

$$\therefore \frac{PM^2}{TP^2} = \frac{OM.OL}{4OL^2}$$

$$\therefore \frac{PM^2}{TP^2} = \frac{OM}{4OL}$$

$$\therefore \frac{PM}{TP} = \frac{1}{2}\sqrt{\frac{OM}{OL}}$$



(5)

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