Gr 11 Maths P II Memo (May 2016)

1.1 $AC = \sqrt{(3+3)^2 + (2-1)^2}$ ✓✓ f s

$= \sqrt{36+1}$

$= \sqrt{37}$ ✓ NB surd form

1.2. $\left(\frac{3-4}{2}; \frac{2-5}{2}\right)$

$= B\left(-\frac{1}{2}; -1\frac{1}{2}\right)$ ✓✓

1.3. $m_{AB} = \frac{-1\frac{1}{2} - 1}{-\frac{1}{2} + 3}$ $A(-3;1)$ $B(-\frac{1}{2}; -\frac{3}{2})$

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

$= -1$ ✓

$\therefore$ AB: $y = -x + c$

Sub $(-3;1)$: $1 = 3 + c$ ✓

$-2 = c$ ✓

$\therefore$ $y = -x - 2$ ✓

1.4. $m_{EC} = \frac{2+5}{3+4}$ ✓ subst. $E(-4;-5)$ $C(3;2)$

$= \frac{7}{7} = 1$ ✓

1.5. $m_{AD} = \frac{7-1}{3+3}$ $A(-3;1)$ $D(3;7)$

$= \frac{6}{6} = 1$ ✓

3

2

4

2

1.5 (cont) $\therefore$ $m_{EC} = m_{AD}$ ✓

$\therefore$ EC ∥ AD ✓

[But m_{DC} is u/d.

$\therefore$ DC ∦ AB]

$\therefore$ ABCD is a trapezium as one pair of opp sides is parallel ✓R

4

[15]

2.1. $y = 5x - 3$

$y = 5(0) - 3$

$\therefore$ $y = -3$

$\therefore$ $(0; -3)$ ✓✓

2

2.2) $C(-15; 0)$ $B(0; -3)$

$\therefore$ $m = \frac{-3-0}{0-(-15)}$ ✓ subst.

$= \frac{-3}{15}$

$= -\frac{1}{5}$ ✓

2

2.3) $m_{AB} = 5$ ✓ $m_{BC} = -\frac{1}{5}$

$m_{AB} \times m_{BC} = 5 \times -\frac{1}{5}$ ✓ ✓R

$= -1$ ✓

$\therefore$ AB ⊥ BC ✓ $\therefore$ BC is ✓ a tangent (tan ⊥ rad)

6

[10]

Answer Pages for Grade 11 Paper 2

Name: Solns

Class: _____

Question 3

3.1 Range = max − min = 6 − 1 = 5 hours ✓ (1)

3.2 $n = 2+3+6+4+3+1 = 19$ learners ✓ (1)

3.3

Number of Hours	1	2	3	4	5	6
Frequency	2	3	6	4	3	1

✓✓ (2)

2 5 11 15 18 19

3.4 $\bar{x} = \frac{1\times2 + 2\times3 + \cdots + 6\times1}{19}$ ✓ ✓ num = 63

$= 3,32$ hours ✓ answ only 3/3 (3)

3.5 $M = T_{\frac{1}{2}(1+19)} = T_{10}$ ✓ = 3 ✓ hours answ only 2/2 (2)

3.6 $M = T_{10} \therefore T_1; \cdots; T_9$ $Q_1 = T_{\frac{1}{2}(1+9)} = T_5 = 2$ ✓

$T_{11}; \cdots; T_{19}$ $Q_3 = T_{\frac{1}{2}(11+19)} = T_{15} = 4$ ✓

$\therefore IQR = Q_3 - Q_1 = 4 - 2 = 2$ ✓

$\therefore 5 - IQR = \frac{IQR}{2} = \frac{2}{2} = 1$ ✓ (4)

[13]

4.1. $\sin 70° = 0,94$ ✓ (1)

4.2. $3\cos\alpha - 1 = 0$ ✓

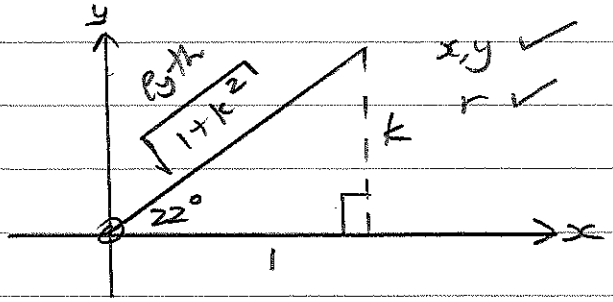
$\cos\alpha = \frac{1}{3}$ ✓

$\alpha = \cos^{-1}(\frac{1}{3})$

$= 70,53°$ (2)

4.3. $\tan 22° = k$

$= \frac{k}{1}$ $\frac{y}{x}$



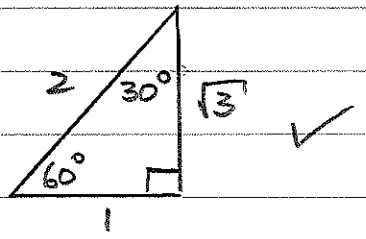
x, y ✓

r ✓

$\sin 22° = \frac{y}{r}$

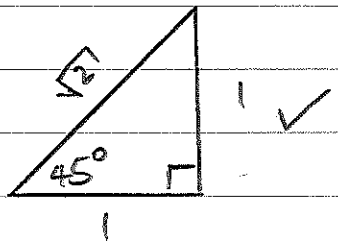
$= \frac{k}{\sqrt{1+k^2}}$ ✓ (3)

4.4. 1.



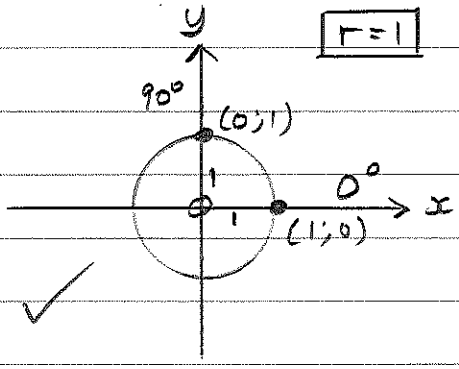
✓ (1)

2.



✓ (1)

4.4. 3.



✓ (1)

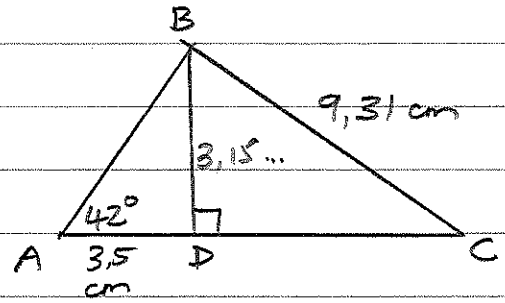
4.5.1. $\tan 60° = \frac{\sqrt{3}}{1}$ ✓ $\frac{o}{a}$

$= \sqrt{3}$ (1)

2. $\cos 90° = \frac{0}{1}$ ✓ $\frac{x}{r}$

$= 0$ (1)

4.6.



4.6. $\tan 42° = \frac{BD}{3,5}$ ✓ $\frac{o}{a}$

$3,5 \cdot \tan 42° = BD$

$3,15... = BD$ ✓

$\sin \hat{C}$ ✓ $= \frac{3,15...}{9,31}$ $\frac{o}{h}$

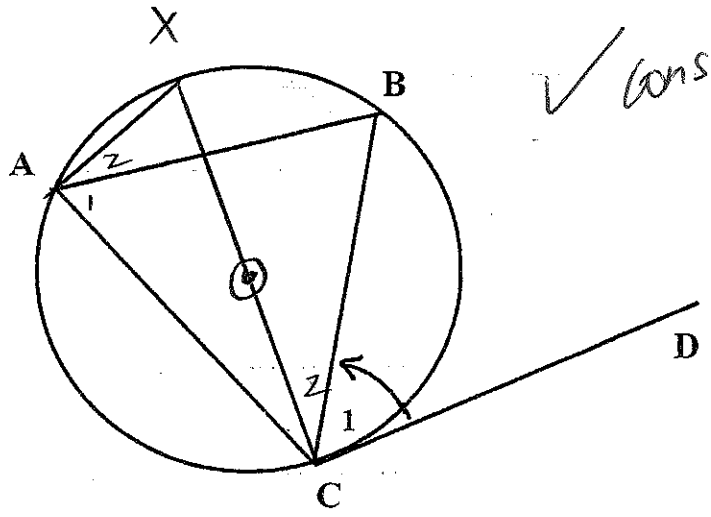
$= 0,33...$ ✓

$\therefore \hat{C} = \sin^{-1}(0,33...)$

$= 19,79°$ ✓ (5)

NB only round off final answer

Question 5



✓ constr

let O be the centre of the circle.

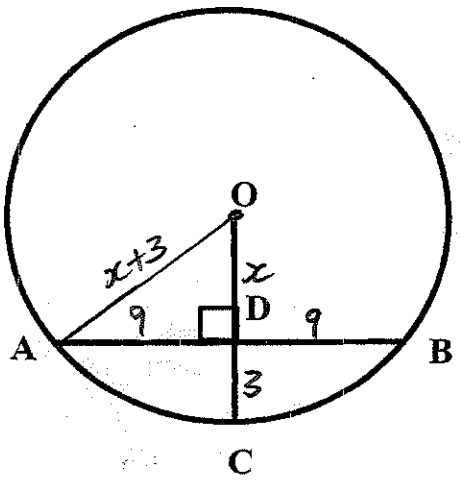
$\hat{C}_1 + \hat{C}_2 = 90°$ ✓SR tan ⊥ rad

$\hat{A}_1 + \hat{A}_2 = 90°$ ✓SR ∠ in semi ⊙ = 90°

but $\hat{A}_2 = \hat{C}_2$ ✓S ✓R ∠'s in same ⊙ segm =

$\therefore \hat{C}_1 = \hat{A}_1$ ⟹ (5)

Question 6



6.1 $AD = DB$ ✓S line centre ⊙ ⊥ to chord ✓R bisects chord (2)

$= 9$ cm ✓

6.2. $OA = x+3$ ✓SR radii

$(x+3)^2 = 9^2 + x^2$ Pythag ✓SR

$x^2 + 6x + 9 = 81 + x^2$

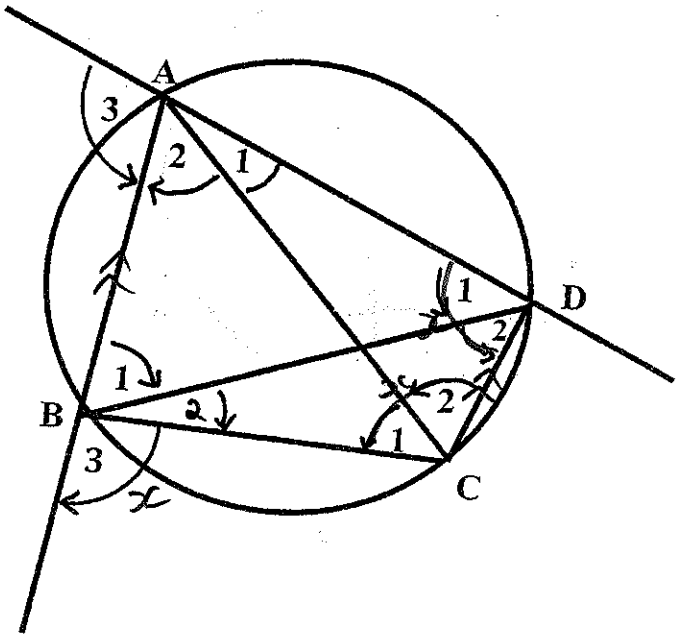
$6x = 72$

$x = 12$ ✓

$\therefore OC = 12+3$

$= 15$ cm ✓ (4)

Question 7



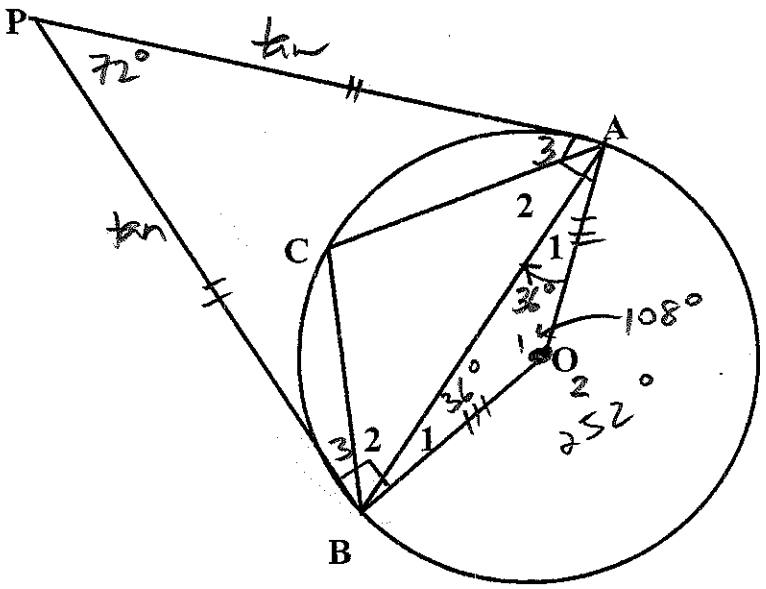
$\hat{D}_{1+2} = x$ ✓S ✓R Ext ∠ cyclic quad

$\hat{C}_{1+2} = x$ ✓S ✓R alt ∠s =, AB ∥ CD

$\hat{A}_3 = x$ ✓S ✓R Ext ∠ cyclic quad

(6)

Question 8



8.1. $\hat{A}_{1+2+3} = 90°$ ✓SR tan ⊥ rad

$\hat{B}_{1+2+3} = 90°$ ✓SR tan ⊥ rad

$\therefore A_{1+2+3} + B_{1+2+3}$

$= 90° + 90°$

$= 180°$ ✓S

$\therefore$ APBO is a cyclic quad ✓R conv opp ∠'s cyclic quad = 180° (4)

8.2. AP = PB ✓SR tan's ext pt =

AO = BO ✓SR radii

$\therefore$ APBO is a kite ✓R both prs adj sides = (3)

8.3. $\hat{B}_1 = 36°$ ✓SR radii

$\therefore \hat{O}_1 = 108°$ ✓SR ∠s opp = sides ∠s Δ = 180°

$\therefore \hat{P} = 72°$ ✓S ✓R opp ∠s cyclic quad = 180°

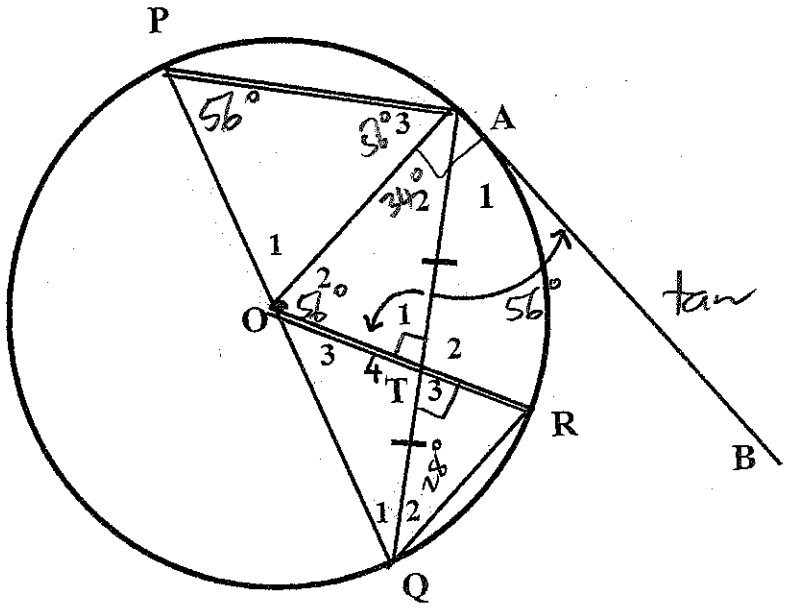
(4)

8.4. $\hat{O}_2 = 252°$ ✓S ✓R 1 rev = 360°

$\therefore \hat{C} = 126°$ ✓S ✓ft at centre

(4)

Question 9



9.1.1. tan ⊥ rad ✓ (1)

9.1.2. ∠ in semi ⊙ = 90° ✓ (1)

9.2.1. $A\hat{P}Q = 56°$ ✓S ✓R ∠ tan chord (2)

9.2.2. $\hat{T}_1 = 90°$ ✓S line centre ⊙ to mdpt chord is ⊥ chord ✓R

$\hat{A}_2 = 34°$ ✓S $\hat{A}_{1+2} = 90°$ (9.1.1.)

$\therefore \hat{O}_2 = 56°$ ∠'s Δ = 180° ✓SR (4)

9.2.3. $\hat{Q}_2 = 28°$ ✓S ✓R ∠ at centre (2)

9.3. $\hat{A}_3 = 56°$ ✓SR (9.1.2.) (4)

$\therefore \hat{A}_3 = \hat{O}_2$ ✓S both = 56°

$\therefore$ PA ∥ OR ✓S ✓R alt ∠s =

OR

$\hat{A}_{2+3} = 90°$ (9.1.2)

$\hat{T}_1 = 90°$ line centre ⊙ to midpt chord is ⊥

$\therefore \hat{A}_{2+3} + \hat{T}_1$

$= 90° + 90°$

$= 180°$

$\therefore$ PA ∥ OR cont ∠s = 180°