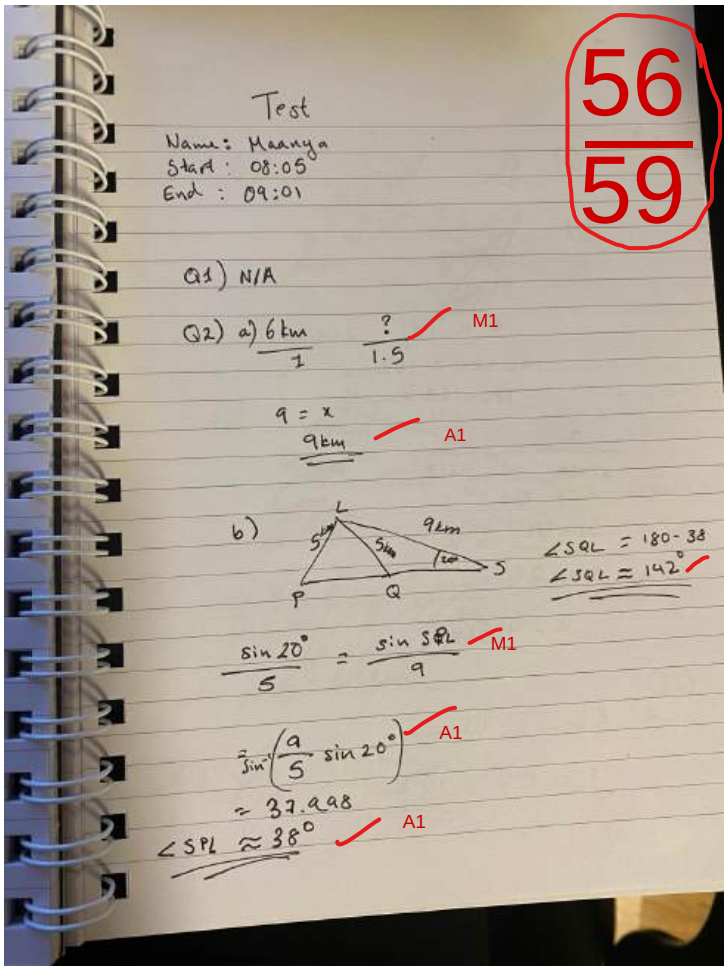
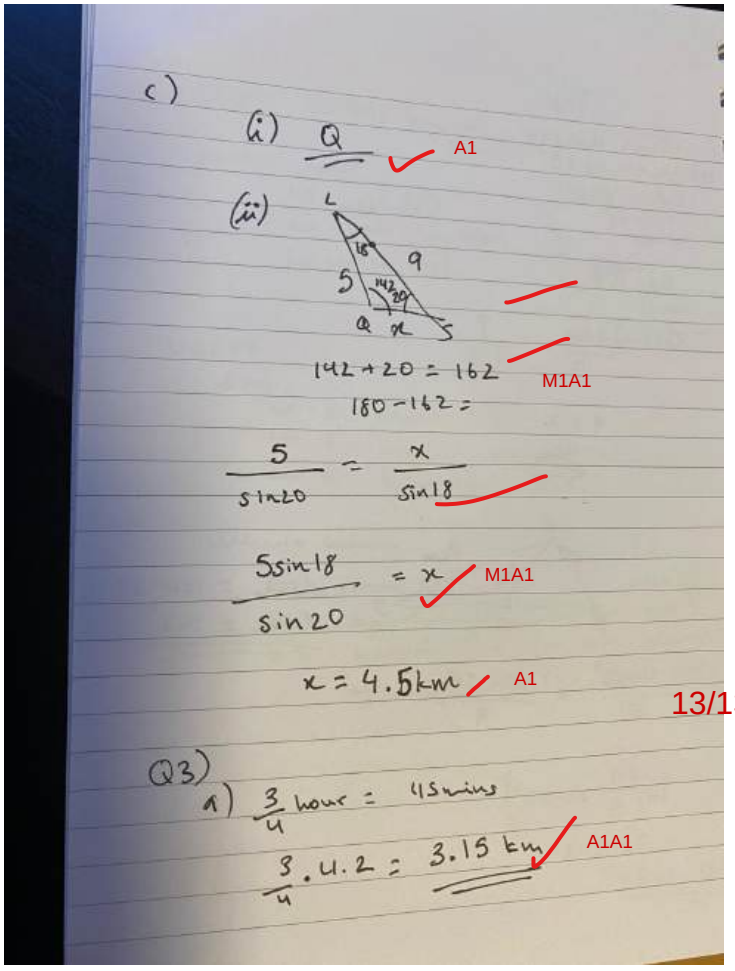
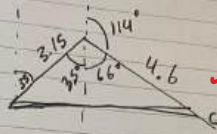

56
59
Test
Name: Maanya
Start: 08:05
End: 09:01
Q1) N/A
Q2) a) 6 km / 1 = ? / 1.5
M1
9 = x
9km
A1
b)
L
9km
5km
5km
20°
S
P
Q
∠SQL = 180 - 38
∠SQL ≈ 142°
M1
A1
sin 20° / 5 = sin SQL / 9
M1
= sin⁻¹(9/5 sin 20°)
A1
= 37.998
∠SPL ≈ 38°
A1


c)
(i) Q
A1
(ii)
L
15°
9
5
142°
20°
Q
x
S
142 + 20 = 162
M1A1
180 - 162 =
5 / sin 20 = x / sin 18
5 sin 18 / sin 20 = x
M1A1
x = 4.5km
A1
13/13
Q3)
a) 3/4 hour = 45 mins
3/4 . 4.2 = 3.15 km
A1A1

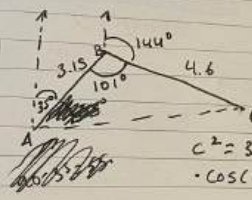
b)

(i)



$35 + 66 = 101°$ A1AG

(ii)



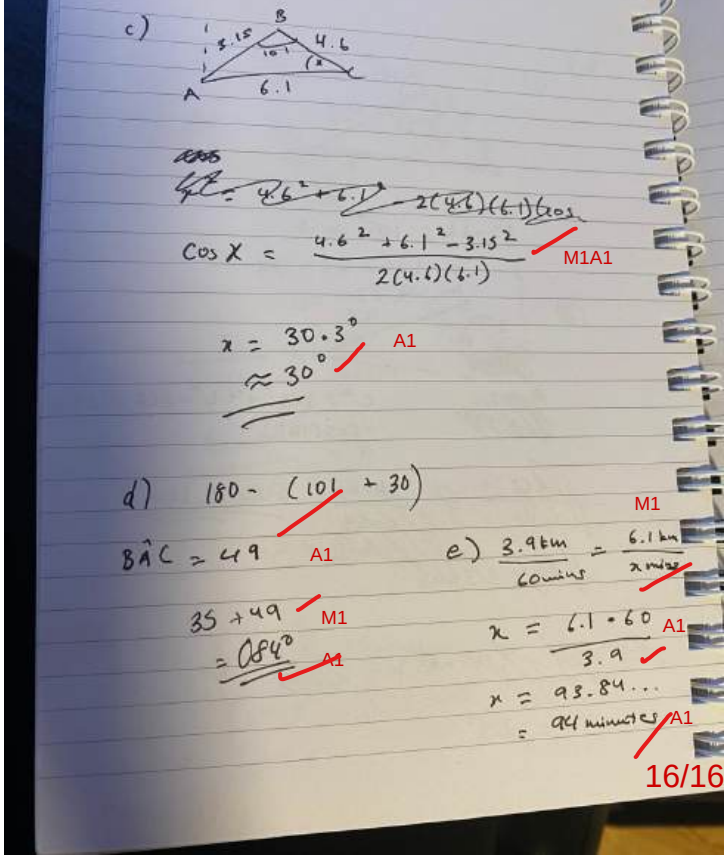
$c^2 = 3.15^2 + 4.6^2 - 2(3.15)(4.6)\cdot\cos(101)$ M1A1

$\frac{AC}{\sin 101} = \frac{4.6}{\sin 35}$ $c = 6.1\text{ km}$ A1

$AC = 5.5\text{ km}$

$180 - (101 + 35) = \angle C$

$= 24°$



c)

$\cos X = \frac{4.6^2 + 6.1^2 - 3.15^2}{2(4.6)(6.1)}$ M1A1

$x = 30.3°$ A1

$\approx 30°$

d) $180 - (101 + 30)$

$B\hat{A}C = 49$ A1

$35 + 49$ M1

$= 084°$ A1

e) $\frac{3.9\text{km}}{\text{cosins}} = \frac{6.1\text{km}}{x\text{ mins}}$ M1

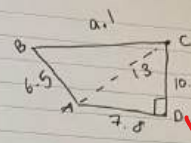
$x = \frac{6.1 \cdot 60}{3.9}$ A1

$x = 93.84...$

$=$ 94 minutes A1

16/16

Q4)



A1

$AC = \sqrt{7.8^2 + 10.4^2}$ M1

$= 13$

$\cos A\hat{B}C = \frac{9.1^2 + 6.5^2 - 13^2}{2(9.1)(6.5)}$ M1

$A\hat{B}C = 111.8°$ A1

$A\hat{B}C = 180 - 111.8$

$= 112$

$A\hat{B}C = 68°$

4/5

Q5)

$\frac{x}{2} + \frac{x}{3} = \frac{\pi}{4}$ or $\frac{9\pi}{4}$ A1M1

$x = \left(\frac{\pi}{4} - \frac{\pi}{3}\right)2$ R1 $\frac{x}{2} + \frac{x}{3} = \frac{9\pi}{4}$ A1

$x = -\frac{1}{6}\pi$ ✗ $x = \left(\frac{9\pi}{4} - \frac{\pi}{3}\right)2$

$x = \frac{17}{6}\pi$ A1

5/5

Q6) N/A

Q7)

a) $r\theta$

$10 \cdot 1.2$ A1

$ACB = 12\,cm$ A1

b) $r\theta = 10 \cdot (2\pi - 1.2)$ M1A1

~~working~~

$r = 10$

$\theta = 50.83185307$

$= \text{perimeter} = 508.32 + (10)2$

$P = 528cm$ (3 s.f.)

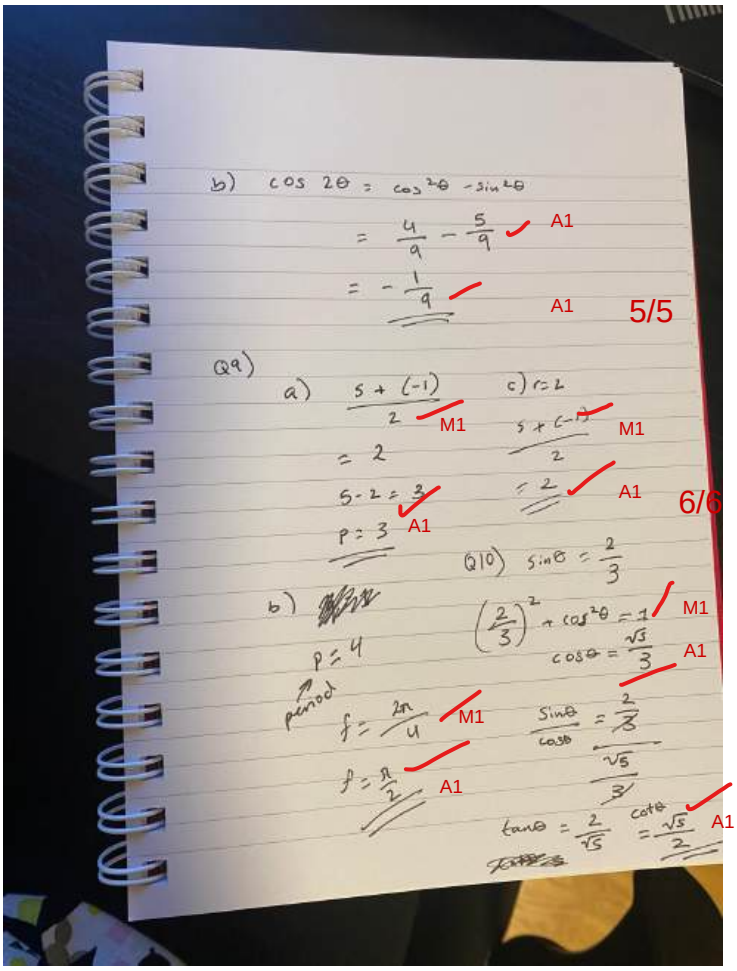
4/5

Q8)

a) $\left(\frac{\sqrt{5}}{3}\right)^2 + \cos^2\theta = 1$ M1

$\cos^2\theta = 1 - \frac{5}{9} = \frac{4}{9}$ A1

$\cos\theta = \frac{2}{3}$ A1



b) $\cos 2\theta = \cos^2\theta - \sin^2\theta$

$= \frac{4}{9} - \frac{5}{9}$ A1

$= -\frac{1}{9}$ A1 5/5

Q9)

a) $\frac{5 + (-1)}{2}$ M1

$= 2$

$5 - 2 = 3$

$p = 3$ A1

b) ~~[illegible]~~

$p = 4$

period

$f = \frac{2\pi}{4}$ M1

$f = \frac{\pi}{2}$ A1

c) $r = 2$

$\frac{5 + (-1)}{2}$ M1

$= 2$ A1 6/6

Q10) $\sin\theta = \frac{2}{3}$

$\left(\frac{2}{3}\right)^2 + \cos^2\theta = 1$ M1

$\cos\theta = \frac{\sqrt{5}}{3}$ A1

$\frac{\sin\theta}{\cos\theta} = \frac{\frac{2}{3}}{\frac{\sqrt{5}}{3}}$

$\tan\theta = \frac{2}{\sqrt{5}}$ $\cot\theta = \frac{\sqrt{5}}{2}$ A1 3/4