Unit 1
Semester 1 2018
Mathematics Methods Test 1

Baldivis Secondary College

Name	SOLUTIONS	Score	Resource Free	
			Resource Assisted	
			Total	

Attempt all questions and full working out must be shown to get full marks.

Total Time: 60 minutes

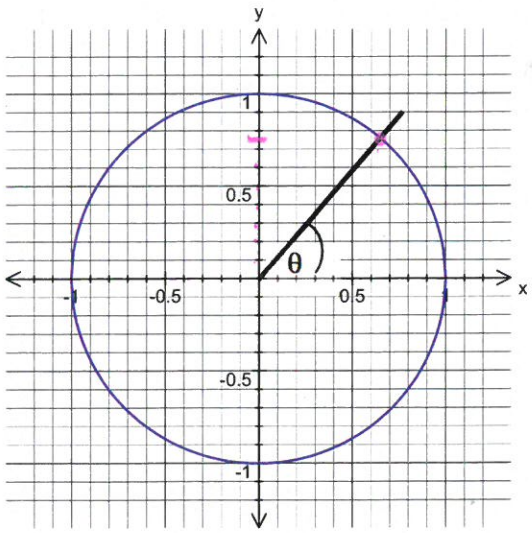
- **Section 1 (Calculator Free): 25 minutes 24 marks**
- **Section 2 (Calculator Assisted): 35 minutes 31 marks**

Calculator Free

Question 1 **(4 marks)**

Using the unit circle supplied

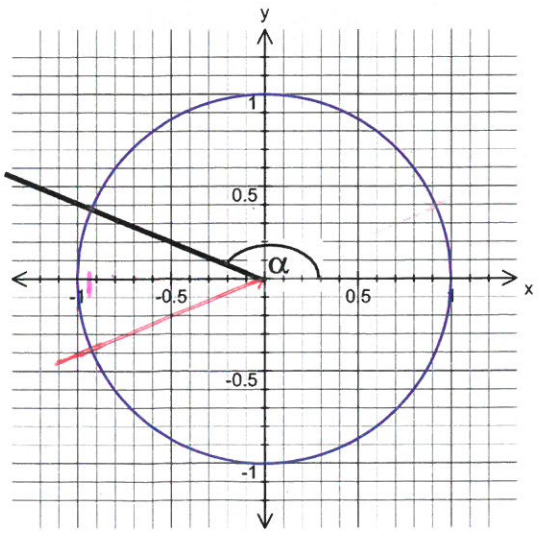
(a)



(i) find sin θ

sin θ = 0.75

(b)



(i) find cos θ

cos θ = -0.92

ii) draw the other angle with the same

Question 2 **(7 marks -1,1,1,1,1,2,)**

(a) Convert these angles into degrees:

(i) $\frac{2\pi}{3} \times \frac{180}{\pi} = 120°$ ✓

(ii) $\frac{5\pi}{6} \times \frac{180}{\pi} = 150°$ ✓

(b) Express these angles in radians

(i) $30° \times \frac{\pi}{180} = \frac{\pi}{6}$ ✓

(ii) $210° \times \frac{\pi}{180}$. $\frac{7\pi}{6}$ ✓

(c) State the exact value of sin (2π)

$\sin 360° = 0$ ✓

(d) Write down the exact values of $sin\left(\frac{11\pi}{4}\right)$ $\left(\frac{2\pi}{3}\right)$ $\frac{11\pi}{4} \times \frac{180}{\pi}$ ✓

$\sin(120) = \frac{\sqrt{3}}{2}$. ✓

Question 3 **(2 marks)**

Simplify and express with a rational denominator: $\frac{\sqrt{7}-6}{\sqrt{7}+6}$

$\frac{\sqrt{7}-6}{\sqrt{7}+6} \times \frac{\sqrt{7}-6}{\sqrt{7}-6} = \frac{(\sqrt{7}-6)(\sqrt{7}-6)}{(\sqrt{7}+6)(\sqrt{7}-6)}$ ✓

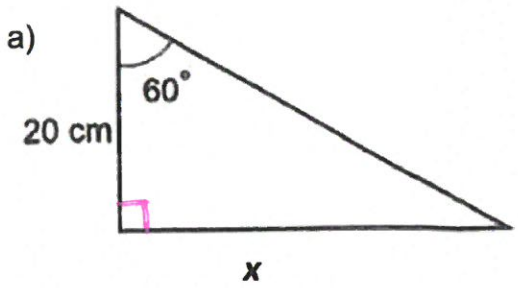
$= \frac{7-12\sqrt{7}+36}{7-36}$

$= \frac{43-12\sqrt{7}}{-29}$ ✓

Question 4 **(8 marks)**

i) Find x in simplified exact form in each of these two diagrams:

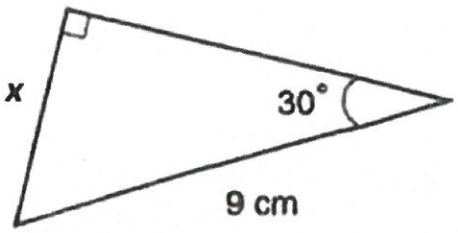
a)



$\tan 60° = \frac{x}{20}$

$x = 20\sqrt{3}$ cm

b)



$\sin 30° = \frac{x}{9}$

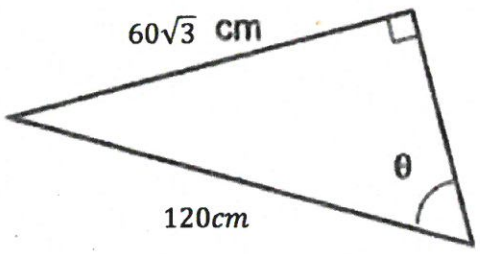
$x = 9 \sin 30°$

$= 9 \times \frac{1}{2}$

$= 4.5$ cm

ii) Find θ in each of the following two diagrams.

a)

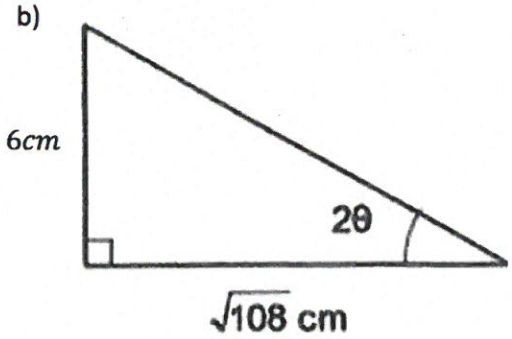


$\sin\theta = \frac{60\sqrt{3}}{120}$

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

$\theta = 60°$

b)



$\tan 2\theta = \frac{6}{\sqrt{108}}$

$\tan 2\theta = \frac{6}{6\sqrt{3}}$

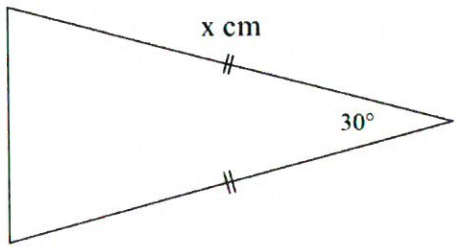
$\tan 2\theta = \frac{1}{\sqrt{3}}$

$2\theta = 30°$

$\theta = 15°$

Question 5 **(3 marks)**

The triangle shown below has an area of 36 cm^2, determine the value of x.



$\text{Area} = \frac{1}{2}ab\sin C$

$36 = \frac{1}{2}x^2 \sin 30°$ ✓

$36 = \frac{1}{2} \times x^2 \times \frac{1}{2}$

$36 = \frac{1}{4}x^2$ ✓

$x^2 = 144$

$x = \sqrt{144}$

$= 12\text{ cm}$ ✓