APPLECROSS
SENIOR HIGH SCHOOL

YEAR 11 MATHEMATICS METHODS UNIT 1

TEST 1
TERM 1, 2021
Test date: Thursday 4th March

STUDENT NAME: _____

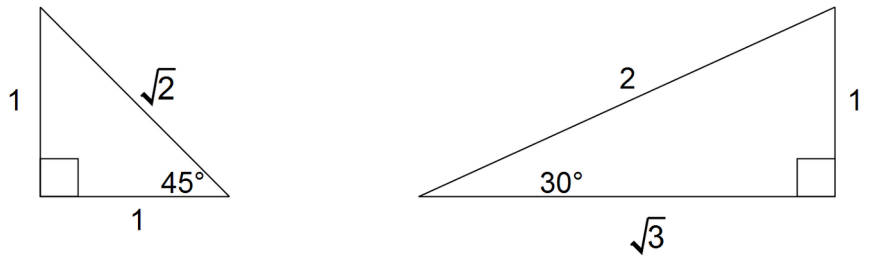
All working must be shown in the space provided. Your working should be in sufficient detail to allow your answers to be checked readily and for marks to be awarded for reasoning. Incorrect answers given without supporting reasoning cannot be allocated any marks. For any question or part question worth more than 2 marks, valid working or justification is required to receive full marks.

	Total	Result	
Section 1	17		**%**
Section 2	33		
Total	50		

Section 1: Resource – Free
Working time: 20 minutes

Question 1 [1, 2, 2, 2 = 7 marks]

Consider the two right triangles shown below.



Use the triangles above and reference angles to determine the **exact** value of

(a) cos 60°

(b) sin 225°

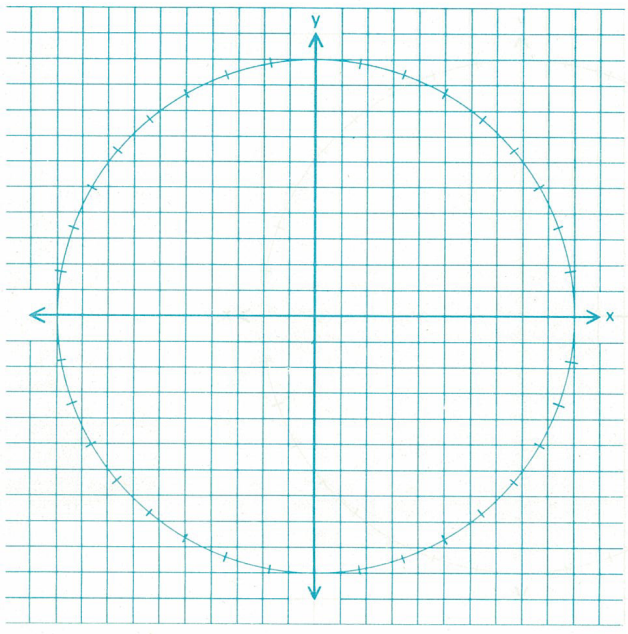
(c) θ , where $\tan\theta = \frac{1}{\sqrt{3}}$ for $0 \leq \theta \leq 360^\circ$

(d) Use the triangle from page 1 (showing an angle of 30^0) to demonstrate that $\frac{\sin\theta}{cos\theta} = \tan\theta$

Question 2 [1, 2 = 3 marks]

Use the unit circle below to answer the questions on the right.

Give your answers to an appropriate degree of accuracy.



1

(a) Determine the value of sin

(b) Solve for x where $\cos x = -0.8 \wedge 0^o \leq x \leq 360^o$

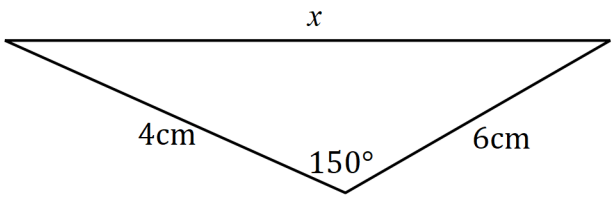
Question 3 [2 marks]

(a) Convert $\frac{5\pi}{6}$ radians to degrees

(b) Express $-285°$ to radians , as a fraction of π.

Question 4 [3, 2 = 5 marks]

(a) Find the exact value of x^2 showing full setting out.



(b) Calculate the area of the triangle.

End of Section 1

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	Total	Result	
Section 1	17		**%**
Section 2	33		
Total	50		

Section 2: Resource – Rich

Working time: 35 minutes

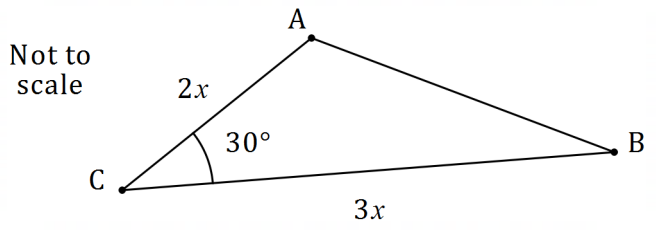
Question 1 [8 marks]

(a) Determine the area of triangle PQR when $\angle PQR = 26°$, $\angle PRQ = 122°$ and $PQ = 57$ cm.

(4 marks)

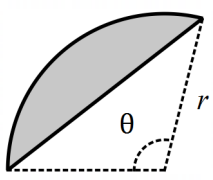
(b) The area of triangle ABC is 96 cm^2, $\angle ACB = 30°$ and $2BC = 3AC$ as shown in the diagram. Determine the value of x and then calculate the length of AB.

(4 marks)



Question 2 [2, 3 = 5 marks]

A segment of a circle of radius 22 cm is shown below, where $\theta = \frac{7\pi}{10}$.

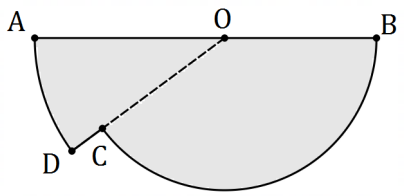


(a) Determine the area of the segment. (2 marks)

(b) Determine the perimeter of the segment. (3 marks)

Question 3 [5 marks]

Shape $AOBCDA$ below consists of sector BOC of circle centre O joined to sector DOA of a different circle, also centre O. AB is a line of length 65 cm, arc AD is 12 cm long and $\angle AOD = 0.32$ radians.



(a) Determine the length OA. (2 marks)

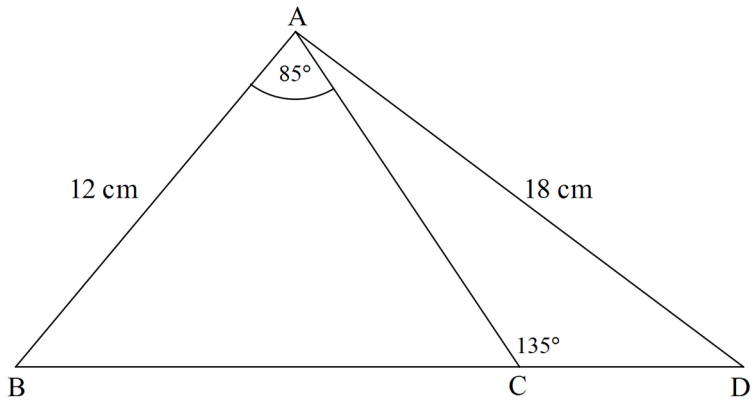
(b) Determine the area of the shape. (3 marks)

Question 4 [3 marks]

Calculate, to the nearest degree, the acute angle between the line $y=1.5x-4$ and the line $y=-0.5x+4$.

Question 5 [6 marks]

Determine, correct to 2 decimal places, the length of side BD in the diagram below.

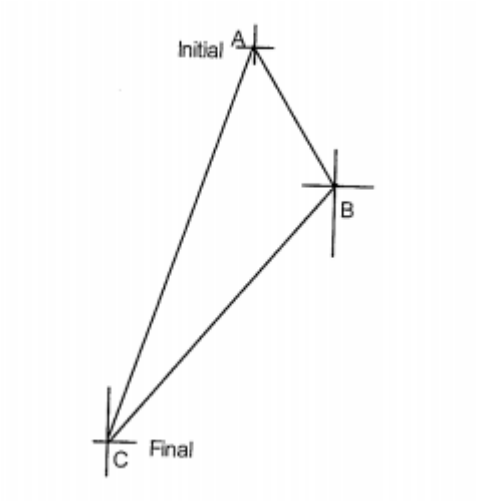


Note: the diagram is not drawn to scale.

Question 6 [1, 2, 3 = 6 marks]

A boat sails from A in the direction 125^o for 40 km. It then sails along 210^o for 100 km.

(a) Complete the diagram below to show this information. (1 mark)



(b) Calculate the direct distance between A and its final position. (2 marks)

(c) Find the **bearing** of A from its final position. (3 marks)

End of Section 2