

Carlingford High School



Year 10 (5.3) Mathematics

Term 3 Examination

2018

Time allowed: 50 minutes

Student Name: _____ Class: 10MA3__

Circle your teacher: Ms Lobejko Ms Lego Ms Aung

Instructions:

- Use black pen. Pencil may be used for graphs and diagrams.
- Board approved calculators may be used.
- Write all answers in spaces provided.
- Show all necessary working.
- Extension questions are marked with an asterisk (*).

Section	1. Trigonometry	2. Solving Inequalities and Regions	3. Coordinate Geometry	Total
Mark	/22	/13	/17	/52

Section 1: Trigonometry

Note: Diagrams are NOT to scale, unless otherwise stated.

Question 1

(1 Mark)

If $\sin A = 0.35$ and $\cos A = 0.21$, find $\tan A$.

Question 2

(1 Mark)

Find the value of α if $\sin 27^\circ 21' = \cos \alpha$.

Question 3

(1 Mark)

Solve the equation $\tan \theta = -0.3$ correct to the nearest degree if θ is between 0° and 180° .

Question 4

(2 Marks)

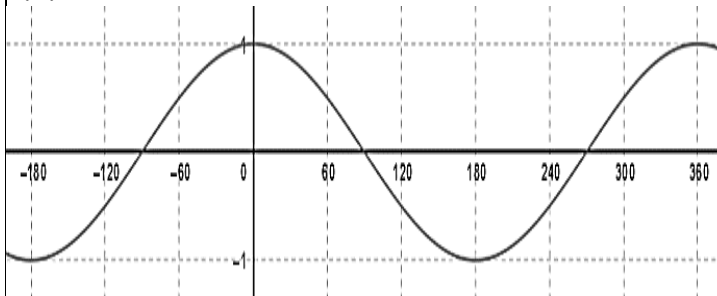
Find the exact value of $\cos 150^\circ$, showing all working.

Question 5

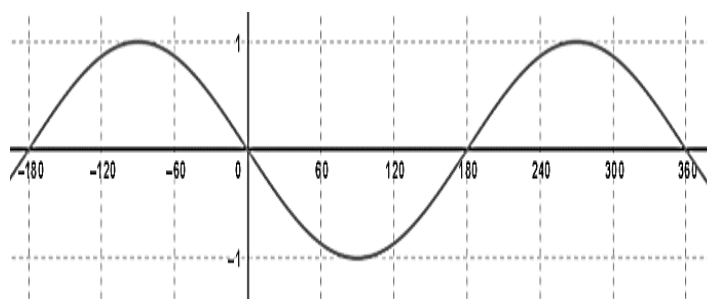
(1 Mark)

Which of the following is the graph of $y = \sin x$?

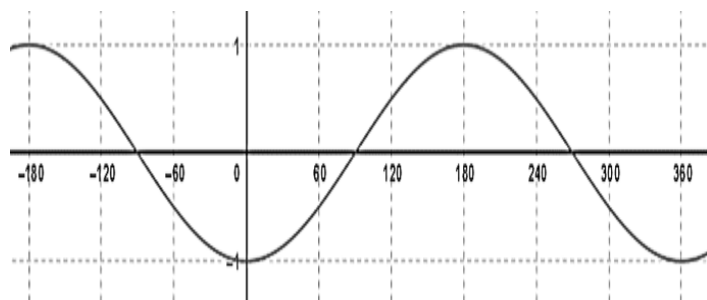
(A)



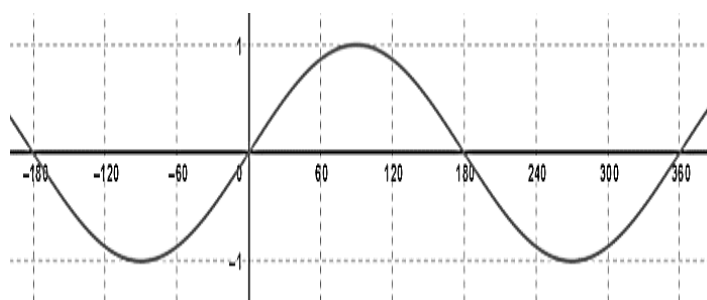
(B)



(C)

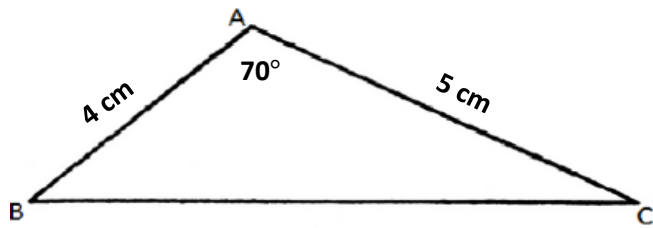


(D)



Question 6

Consider the following $\triangle ABC$.



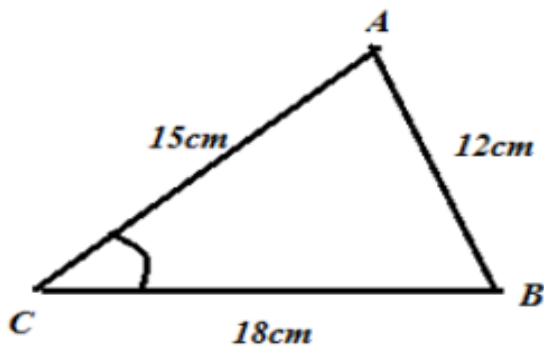
- (a) Find the length of side BC , correct to two decimal places (2 Marks)

- (b) Find the area of $\triangle ABC$, correct to two decimal places. (2 Marks)

Question 7

(2 Marks)

Find the size of angle C , to the nearest minute.



Question 8

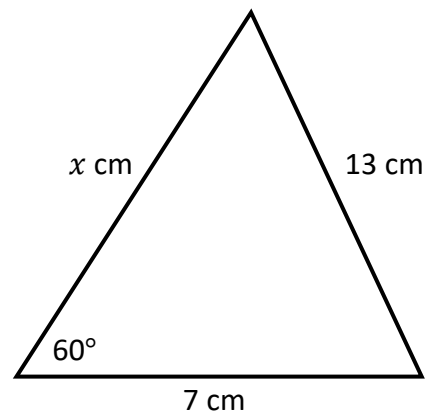
(3 Marks)

In $\triangle STU$, $ST = 35\text{ cm}$, $SU = 45\text{ cm}$ and $\angle T = 70^\circ$. Find all possible values for $\angle U$, correct to the nearest degree. Show all working.

***Question 9**

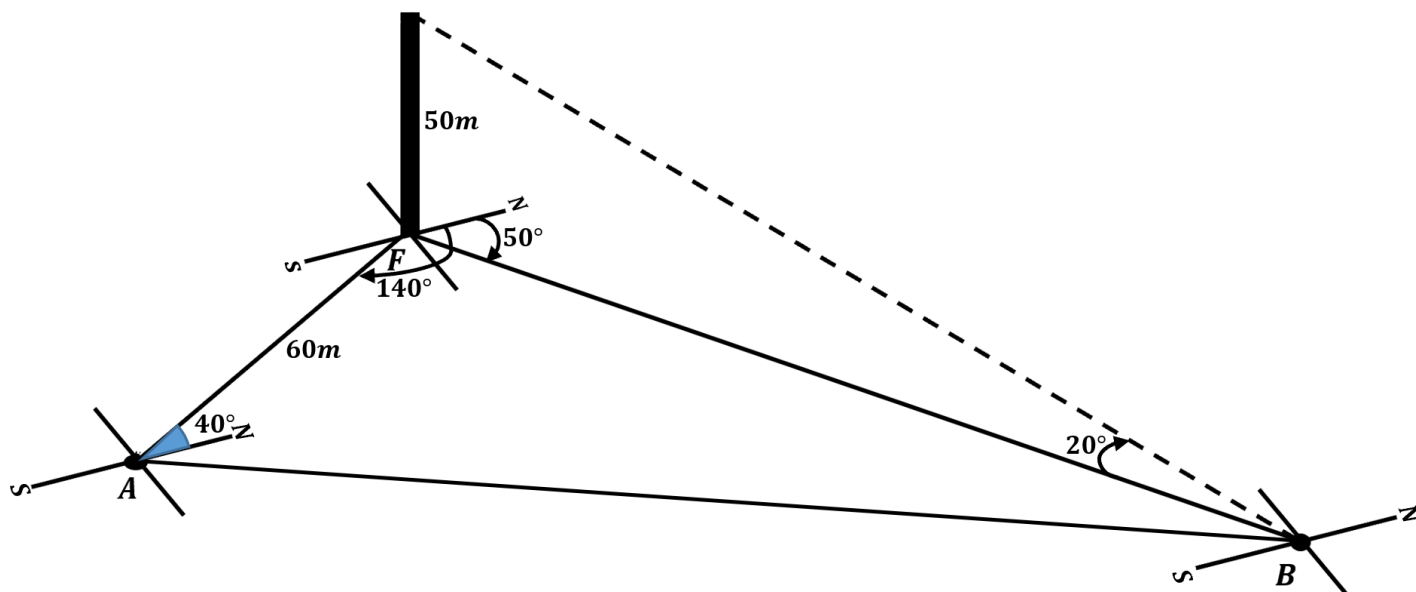
(2 Marks)

For the triangle below, show that $x^2 - 7x = 120$.



Question 10

A flagpole (F) stands $50m$ tall. From the flagpole, point A is on a bearing of 140° and is $60m$ away. Point B is on a bearing of 50° from the same flagpole. The angle of elevation from point B to the top of the flagpole is 20° . An angle of 40° has been marked on the diagram.



(a) How far, to the nearest metre, is point B from the flagpole? **(1 Mark)**

(b) Find the size of $\angle AFB$. Hence, find the distance between A and B , to the nearest metre. **(2 Marks)**

(c) What is the bearing of point A from point B , to the nearest degree? **(2 Marks)**

Section 2: Solving Inequalities and Regions

Question 1

(1 Mark)

Write the following statement as an inequality, using the pronumeral given.

Only people aged (A) 18 to 70 years can donate blood.

Question 2

Solve the following inequalities and graph the solution on a number line.

(a) $16 > 4(2 + x)$

(2 Marks)



(b) $11 - 3x \leq 20$

(2 Marks)



Question 2 continued

(c) $6 \leq -2(x + 4) < 10$

(2 Marks)



Question 3

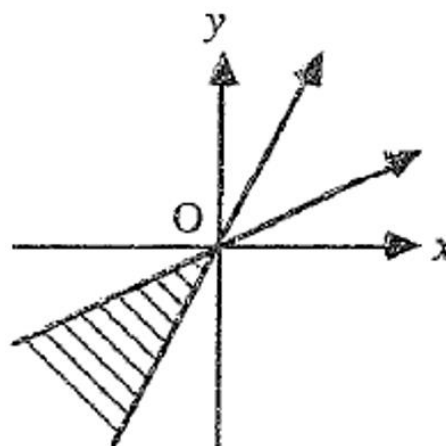
(2 Marks)

Solve: $\frac{5+3k}{4} < \frac{k}{2}$

Question 4

(1 Mark)

Which pair of inequalities could represent the shaded region?



(A) $y \leq \frac{1}{3}x$, $y \leq 3x$

(B) $y \leq \frac{1}{3}x$, $y \geq 3x$

(C) $y \geq \frac{1}{3}x$, $y \leq 3x$

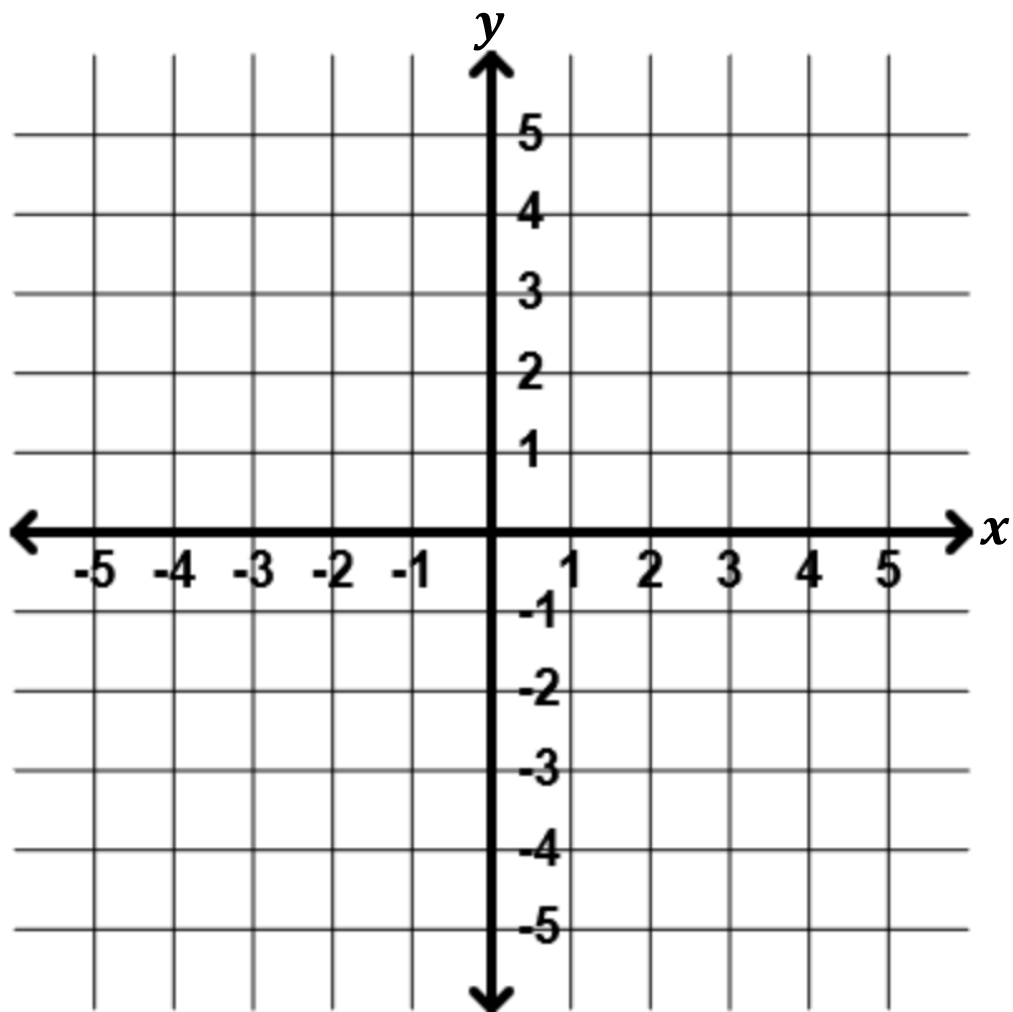
(D) $y \geq \frac{1}{3}x$, $y \geq 3x$

Question 5**(3 Marks)**

Graph the following linear inequalities on the number plane provided, and shade the region that satisfies both the inequalities. Use the lines provided for any working.

$$y > -x + 3$$

$$2x - 3y \leq 6$$



Section 3: Coordinate Geometry

Question 1

Line ℓ has the equation $y = \frac{7-4x}{2}$.

(a) Find the gradient and y -intercept of line ℓ .

(2 Marks)

(b) Find the equation, in gradient-intercept form, of the line that is parallel to line ℓ and passes through $(-7,3)$.

(2 Marks)

Question 2

Let A and B be the points $(-4,7)$ and $(-2,1)$ respectively.

(a) Find the length of interval AB , in simplest surd form.

(2 Marks)

Question 2 continued

(b) Find the midpoint of interval AB .

(1 Mark)

(c) The y -intercept of the line that passes through A and B is -5 . Find the equation, in general form, of the line that passes through A and B .

(2 Marks)

(d) The point C has coordinates $(20, -50)$.

Are the points A , B and C collinear? Justify your answer with working.

(2 Marks)

***Question 3**

(3 marks)

Which quadrilateral is formed by joining the points $O(0,0)$, $Q(1,2)$, $R(5,0)$ and $S(4, -2)$? Show all working.

***Question 4**

(a) Prove that the points $(-1, 2\sqrt{2})$ and $(\sqrt{3}, \sqrt{6})$ both lie on the same circle whose centre is at the origin.

(2 marks)

(b) Define the region which is inside and including the circle.

(1 mark)

End of Exam