Carlingford High School

Mathematics

Year 10 Term 3 Examination

5.3 Course

2019

Name: _____ Class: _____

Circle your teacher's name: Ms Sharma, Ms Wilson/Young, Mrs Lobejko

Time allowed: 50 minutes

- Board approved calculators may be used.
- Show all necessary working.
- Marks may be deducted for careless or untidy work.
- Complete the examination in blue or black pen.

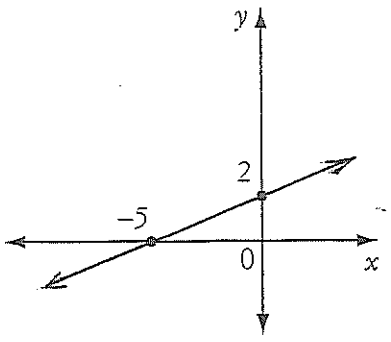
COORDINATE METHODS	INEQUATIONS	TRIGONOMETRY
/16	/10	/26
	Total	/52

COORDINATE METHODS
(16 marks)

1. Find the equation of the line with gradient 4, passing through (0,-7). Write the equation in general form. 2

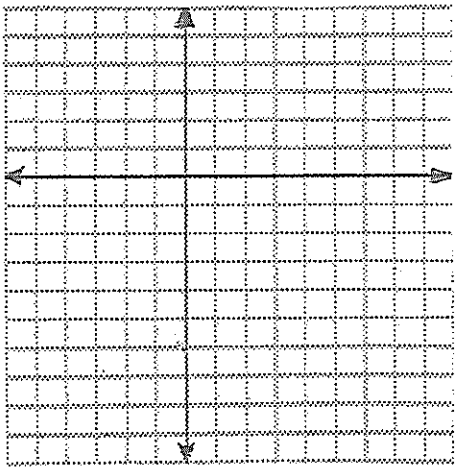
2. (2,3) and (-4,5) lie on the same line. Find the equation of that line. 3

3. With reference to the diagram, find the equation of the line that is perpendicular to the given line and passing through $(-5, 0)$. 3



4. The points A, B and C have coordinates (-2,2), (-1,-5) and (6,-6) respectively.

(a) On the number plane below, sketch the triangle ABC. 1



(b) Show that the midpoint P of AC, has coordinates (2,-2). 1

(c) Show that AC and BP are perpendicular. 3

(d) Find the area of the triangle ABC. 2

INEQUATIONS (10marks)

1. Solve the following inequations and graph the solution on a number line.

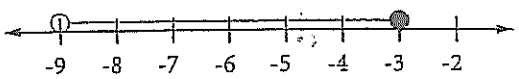
(a) $5 - 3x < 8$ 3

(b) $\frac{3-x}{2} \leq -1$ 3

2. Solve the following equation 3

$$\frac{2x}{3} - \frac{x-1}{2} > 3x$$

3. Write the inequality represented on the following number line. 1



TRIGONOMETRY (26 marks)

1. Find the exact value of:

(a) $\tan 30°$ 1

(b) $\sin 225°$ 2

2. Simplify without the use of a calculator.

(a) $\sin 70° + \cos 20°$ 1

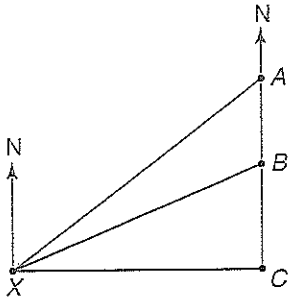
(b) $\dfrac{\sin 70°}{\cos 70°}$ 1

3.

(a) If $\cos\theta = \frac{1}{\sqrt{2}}$ and θ lies in the first quadrant, find θ. 1

(b) Solve $sinx = \frac{-\sqrt{3}}{2}$ for $0° \leq x \leq 360°$ 2

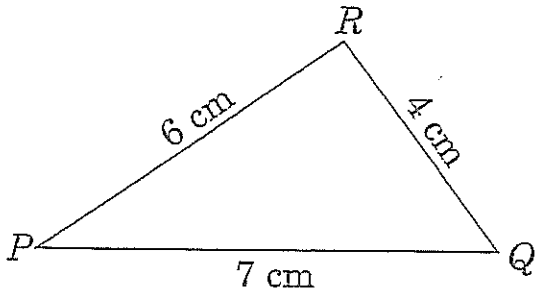
4. A, B and C are three towns where A and B are due north of C. From a position X on a map, A has a bearing of N29°E and B has a bearing of N65°E. Town C is due east of X and 7km from it. Find the distance, correct to one decimal place, between A and B. 3



5. Given that $\cos A = \frac{24}{25}$ find $\tan A$. 2

6. Sketch $y = \sin x$ from 0° to 360° 3

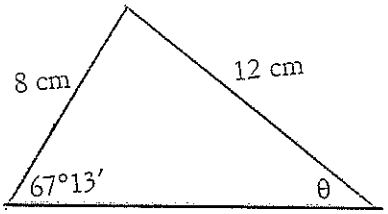
7.



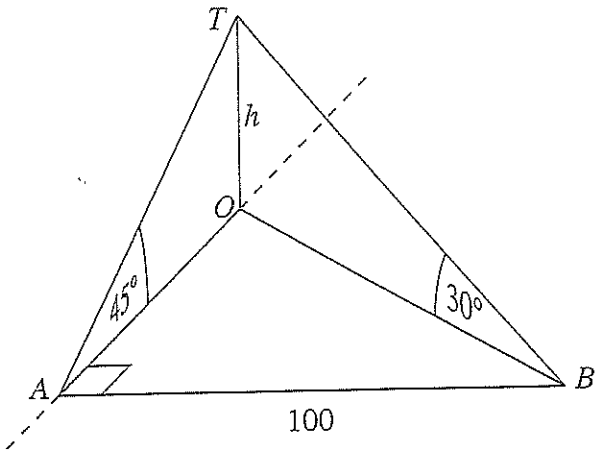
(a) Use the cosine rule to calculate angle RPQ to the nearest degree. 2

(b) Calculate the area of the triangle PQR, giving your answer to two significant figures. 2

8. Calculate angle θ in triangle ABC, correct to the nearest minute. 3



9. A surveyor stands at a point A, which is due south of a tower OT of height h m. The angle of elevation of the top of a tower from A is 45°. The surveyor then walks 100 m due east to point B, from where she measures the angle of elevation of the top of the tower to be 30°.



(a) Express the length of OB in terms of h. 1

(b) Show that $h = 50\sqrt{2}$. 2