SECONDARY SCHOOL ANNUAL EXAMINATIONS – 2006

Educational Assessment Unit – Education Division

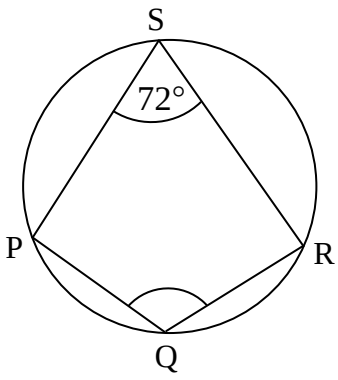
FORM 5 MATHEMATICS (Non Calculator Paper – Option B) TIME: 20 minutes

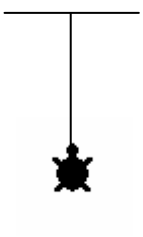
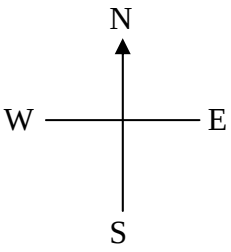
Name:_____ Class: _____

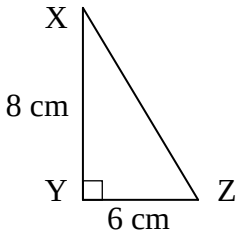
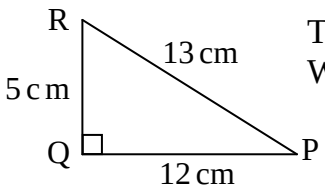
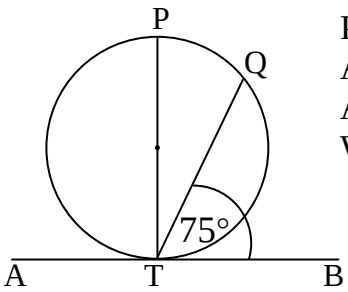
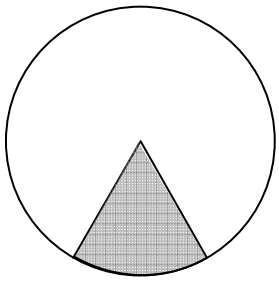
Mark

INSTRUCTIONS TO CANDIDATES

- **Answer all questions. There are 20 questions to answer.**
- **Each question carries 1 mark.**
- **Calculators, rulers, protractors and other mathematical instruments are not allowed.**
- **You are not required to show your working. However space for working is provided if you need it.**

No.	QUESTION	SPACE FOR WORKING (IF REQUIRED)
1.	Find the value of $8{\cdot}3 - 2 \times 4$. Ans:_____	
2.	The **exterior** angle of a **regular** polygon is 36°. This regular polygon has: (A) 5 sides (B) 6 sides (C) 8 sides (D) 10 sides. Ans:_____	
3.	What is the next **even** number after 88 ? Ans:_____	
4.	In a bag there are 4 yellow marbles and 8 green marbles. Kenneth picks a marble at random from the bag. What is the probability that Kenneth picks a yellow marble? Ans:_____	
5.	Given that $58 \times 7{\cdot}8 = 452{\cdot}4$, what is the value of $5{\cdot}8 \times 78$? Ans:_____	
6.	Which of the following is the **best estimate** for the **volume** of a cylinder of radius 4 cm and height 5 cm? (A) 120 cm^3 (B) 240 cm^3 (C) 120 cm^2 (D) 240 cm^2. Ans:_____	
7.	Given that $f(x) = 7x + 5$ find the value of $f(3)$. Ans:_____	
8.	4% of a certain sum of money is Lm18. What is the value of 6% of the same sum of money? Ans:_____	
9.	 PQRS is a cyclic quadrilateral in which ∠PSR is 72°. What is the size of ∠PQR? Ans:_____	

No.	QUESTION	SPACE FOR WORKING (IF REQUIRED)
10.	The turtle starts at the position shown. The turtle is given a set of **LOGO** commands and draws the figure as shown. **PD FD 100 RT 90 FD 50 ____ 100 PU HOME** Which one of the following is the missing command? (A) FD (B) BK (C) RT (D) LT. Ans:_____	
11.	Adrian was using a spreadsheet. In cell **A1** he typed 30. In cell **B1** he typed 32. In cell **C1** he typed 34. Choose the correct formula that Adrian would type in cell **D1** to obtain the **average** of the entries in cells **A1, B1** and **C1**. (A) = **A1**+**B1**+**C1** (B) = **A1**+**B1**+**C1**/3 (C) = **A1 B1 C1** / 3 (D) = (**A1**+**B1**+**C1**)/3. Ans:_____	
12.	 Maria was facing SW. She turned 90° **clockwise**. What direction is she now facing? (A) NW (B) NE (C) SE (D) SW. Ans:_____	
13.	The marks obtained by 7 pupils in a Mathematics test were 2, 3, 4, 5, 6, 6, 8. John was one of these pupils and he obtained 5 marks. John's mark is the: (A) mean (B) mode (C) median (D) range. Ans:_____	
14.	Which of the following is the **best estimate** for $\sqrt{64+16}$? (A) 12 (B) 9 (C) 8 (D) 4. Ans:_____	

No.	QUESTION	SPACE FOR WORKING (IF REQUIRED)
15.	 Triangle XYZ is right-angled at Y. YZ is 6 cm long and XY is 8 cm long. What is the length of XZ? Ans:_____	
16.	The angles of a triangle are in the ratio of 2 : 3 : 4. The size of the **smallest** angle is: (A) 9° (B) 40° (C) 80° (D) 120°. Ans:_____	
17.	 Triangle PQR is right-angled at Q. What is the value of cos P? Ans:_____	
18.	 PT is a **diameter** of the circle. ATB is a **tangent** to the circle at T. Angle BTQ is 75°. What is the size of angle PTQ? Ans:_____	
19.	Does the point with coordinates (2 , 5) lie on the straight line graph of $y = 3x - 1$? Ans:_____	
20.	 The area of a circle is 330·6 cm^2. Find the area of the **shaded sector** of the circle if the angle at the centre is 60°**.** Ans:_____	

SECONDARY SCHOOL ANNUAL EXAMINATIONS – 2006

Educational Assessment Unit – Education Division

FORM 5 MATHEMATICS (Main Paper – Option B) TIME: 1hour 40minutes

1	2	3	4	5	6	7	8	9	10	11	12	13	Total Main	Non-Calculator	**GLOBAL MARK**

DO NOT WRITE ABOVE THIS LINE

Name:_____ **Class:**_____

CALCULATORS ARE ALLOWED BUT ALL NECESSARY WORKING MUST BE SHOWN. ANSWER ALL QUESTIONS.

1. a) Write $0{\cdot}625$ as a **fraction in its lowest terms.**

b) (i) Write the following numbers correct to **1 significant figure** to give an **estimate** for **P**.

$$\mathbf{P} = \frac{(24.37 \times 39.26)^2}{35.73 \times 79.37}$$

(ii) Use your calculator to work out the value of **P** correct to **3 significant figures**.

_____(4 marks)

2 a) Complete the sequence:

7, 10, 13, 16, ____, ____.

b) The nth term for the sequence above is $3n + 4$. Find the 20th term of the sequence.

_____(4 marks)

3. a) A shopkeeper bought a washing machine for Lm240. He then sold it at a profit of 15%.

Work out:
(i) the selling price of the washing machine

(ii) the profit.

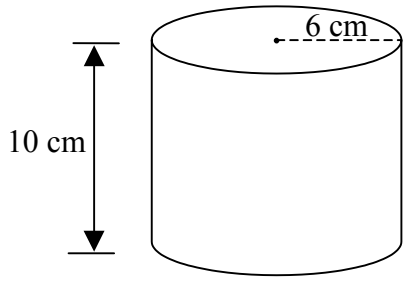
b) Aaron used a spreadsheet to calculate the interest on his Savings Account.
He entered the following data:

	A	B	C	D	E
1	**Principal** (Lm)	**Rate** (%)	**Time** (Years)	**Interest** (Lm)	
2	**800**	**1·5**	**2**	**= A2*B2*C2/100**	
3					

What value did Aaron obtain in cell **D2**?

_____(5 marks)

4.



A cylinder has a radius of 6 cm and a height of 10 cm.

Work out:
a) the **volume** of the cylinder, correct to the **nearest whole number**

b) the **curved surface area** of the cylinder, correct to **one decimal place**.

_____(4 marks)

Name _____ Class _____

5. The formula for the area of a trapezium is: $A = \frac{1}{2}(a + b)\, h$.

a) Work out the area of a trapezium when $a = 12{\cdot}5$ cm, $b = 17{\cdot}5$ cm and $h = 8$ cm.

b) Make h the subject of the formula.

(4 marks)

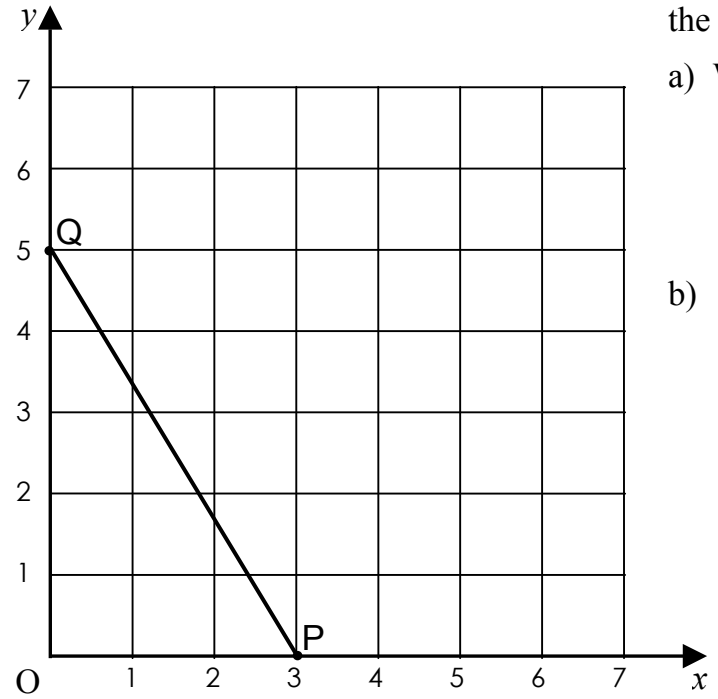
6. ***Use ruler and compasses only. All construction lines and arcs must be clearly shown.***

a) Construct a triangle ABC in which AB = 8.5 cm, BC = 4 cm, and $\angle ABC = 90^o$.
b) Construct the perpendicular bisector of BC. Let this bisector meet AC at D.
c) Measure and write down the size of $\angle BDC$.

A

(5 marks)

7



The figure shows a straight line graph that cuts the x-axis at P and the y-axis at Q.

a) Write down:

(i) the coordinates of P P = (,)

(ii) the coordinates of Q. Q = (,)

b) Work out, showing **all your working**

(i) the area of Δ POQ

_____ units^2

(ii) the length of PQ.

_____ units

(6 marks)

8. Two ordinary 6-sided dice are tossed.

a) **Complete** the possibility space diagram to show all the outcomes.

1st dice \ 2nd dice	**1**	**2**	**3**	**4**	**5**	**6**
1	(1 , 1)	(1 , 2)	(1 , 3)	(1 , 4)	(1 , 5)	(1 , 6)
2	(2 , 1)	(,)	(2 , 3)	(2 , 4)	(2 , 5)	(2 , 6)
3	(3 , 1)	(3 , 2)	(,)	(3 , 4)	(3 , 5)	(3 , 6)
4	(4 , 1)	(4 , 2)	(4 , 3)	(,)	(4 , 5)	(4 , 6)
5	(5 , 1)	(5 , 2)	(,)	(5 , 4)	(5 , 5)	(5 , 6)
6	(,)	(6 , 2)	(6 , 3)	(6 , 4)	(6 , 5)	(6 , 6)

b) Use the possibility space diagram to find the probability of obtaining:

(i) a **double** _____

(ii) a **total score** of 8 _____

(iii) at **least one** prime number**.** _____

(6 marks)

9. A ship sails 30 km on a bearing of 030° from A to B.
The ship then sails 10 km from B to C.

a) How far is B East of A? (distance x)

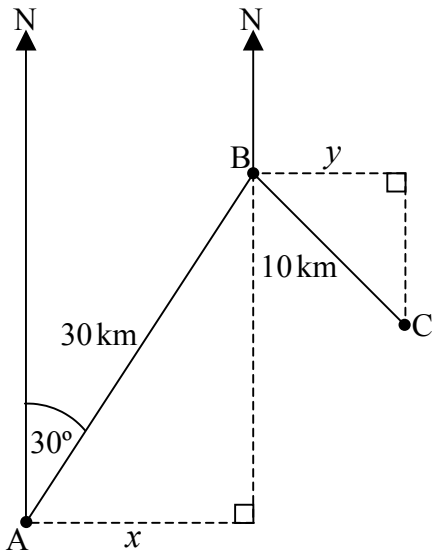


Diagram **NOT** drawn to scale

b) C is 22 km East of A.

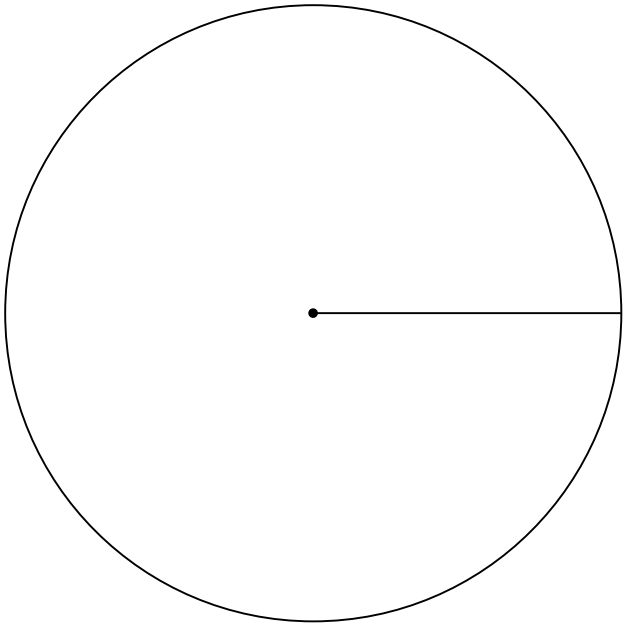
(i) How far is C East of B? (distance y)

(ii) Work out the bearing of C from B. Give your answer correct to the nearest degree.

(6 marks)

10 a) In a local election candidate A received three-eighths of the votes, candidate B received one-third of the votes, candidate C received one-quarter of the votes and candidate D received the remainder.

(i) Draw an accurate and clearly labelled pie chart to represent this information. **Use the circle below**.

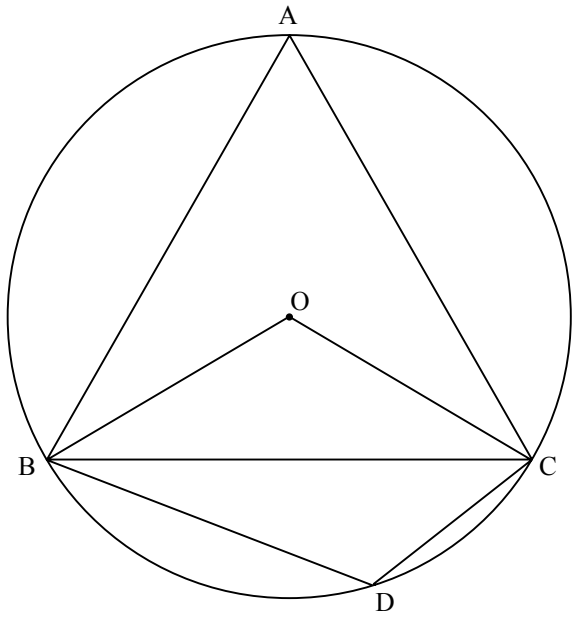


(ii) If candidate B obtained 320 votes, how many people voted altogether?

b) The mean weight of a group of 17 teenagers is 45·5 kg. Joanne joins the group. The mean weight of the 18 teenagers **now** is 45.9 kg. Work out Joanne's weight.

(9 marks)

11 Triangle ABC is an equilateral triangle inscribed in a circle centre O.



a) **Show all your working and give reasons for your answers.**
Find each of the following angles:

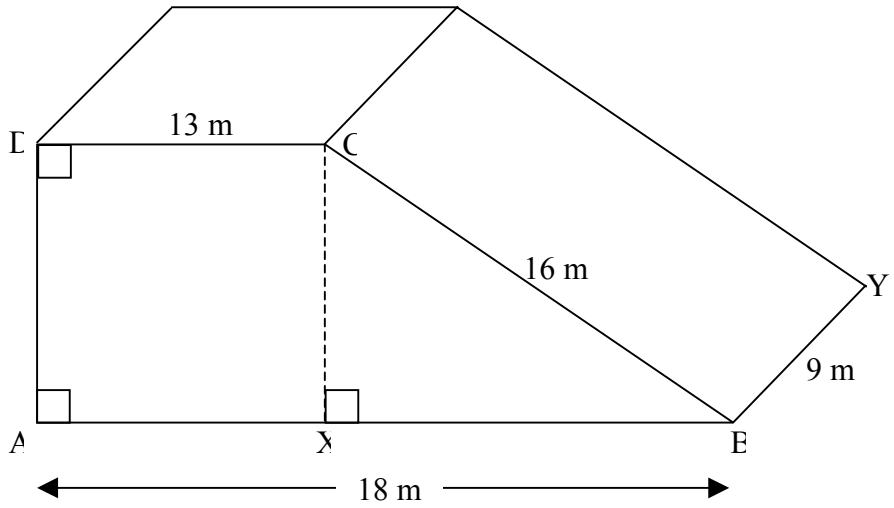
(i) angle AOB

(ii) angle ADB

b) The radius of the circle is 5 cm.
Work out, correct to **three significant figures**, the area of the **minor sector** OBC.

(7 marks)

12. a) The diagram shows a ramp of uniform cross-section.. AB = 18 m, BC = 16 m, CD = 13 m and BY = 9 m.



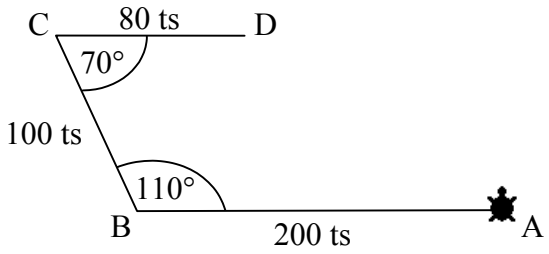
Work out, correct to **three significant figures**:

(i) the height CX

(ii) the area of the cross-section, ABCD

(iii) the volume of the ramp.

b) The figure shows the path traced out by the **LOGO** turtle. The turtle starts at A and travels to D passing through B and C.



Complete this set of **LOGO** commands to trace this journey.

PD LT 90 FD 200 RT ____ FD 100 _____ 110 FD _____ PU HOME

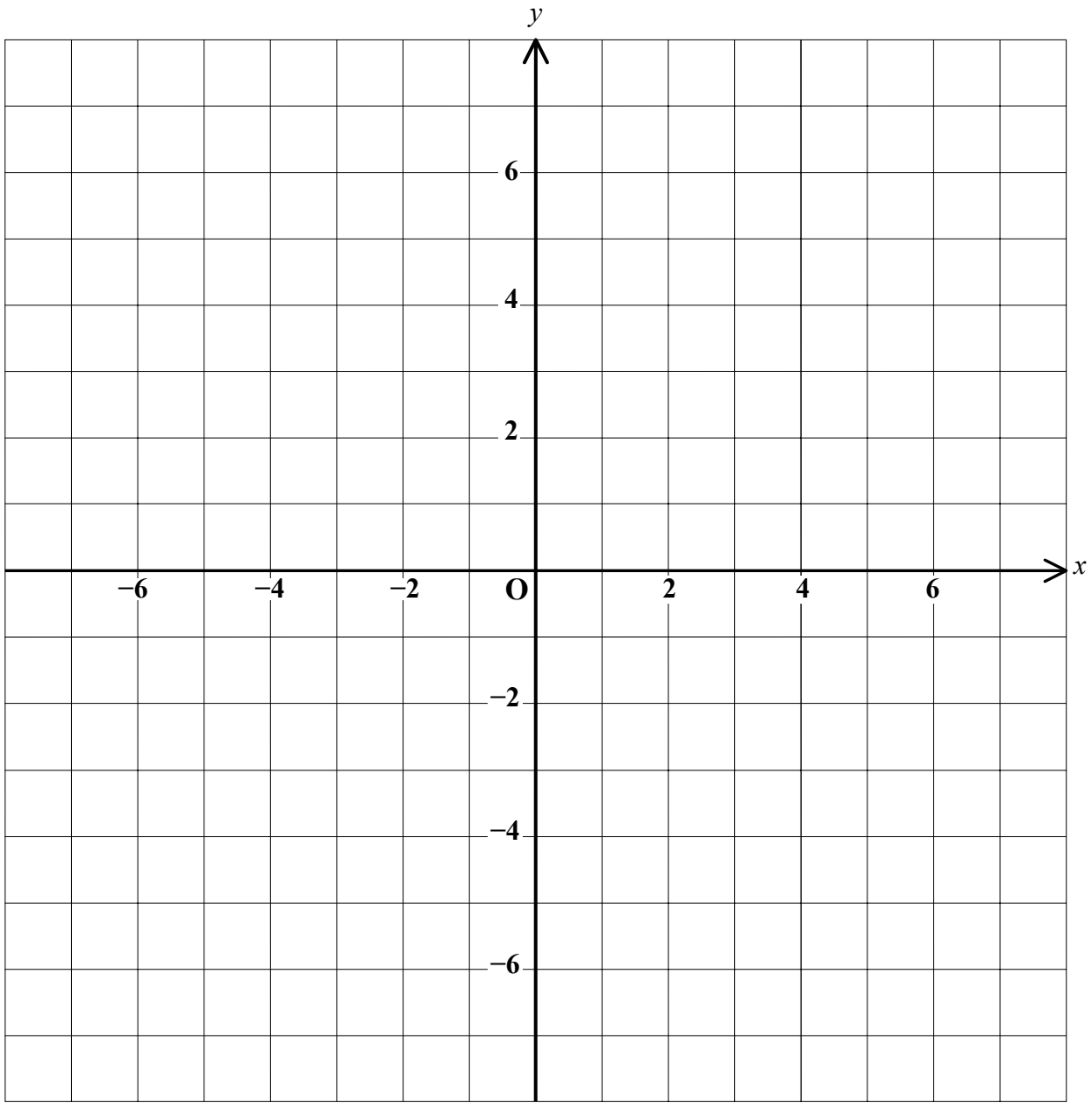
(9 marks)

13. a) On the grid provided, **plot** and **join** the points A (3 , 2), B(6 , 2) and C(3 , 7) to obtain triangle ABC.

b) **Reflect** triangle ABC in the *y*-axis. Label the corresponding vertices of the image A′B′C′.

c) **Rotate** triangle ABC through 90° clockwise about (0 , 0). Label this image R.

d) Plot and draw the points (−2 , −4), (−5 , −4) and (−2 , 1) and label this figure T. Write down the column vector by which triangle A′B′C′ is **translated** to obtain figure T.



(11 marks)

End of paper