



**JUNIOR LYCEUM AND SECONDARY SCHOOL
ANNUAL EXAMINATIONS 2007**

Educational Assessment Unit - Education Division

FORM 4

**MATHEMATICS – Scheme A
(Non-Calculator Paper)**

TIME: 20 minutes

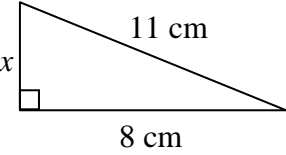
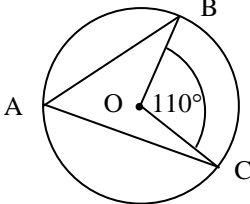
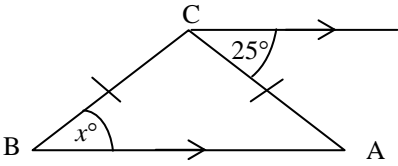
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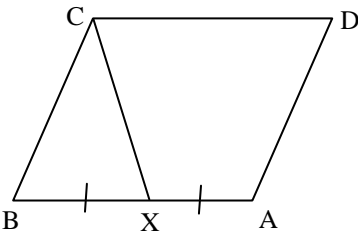
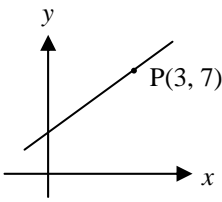
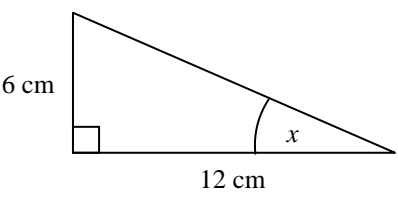
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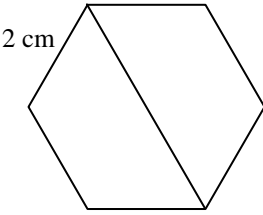
Mark

Instructions to Candidates

- **Answer all questions. There are 20 questions to answer.**
- **Each question carries 1 mark.**
- **Calculators, protractors and other mathematical instruments except rulers 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
1.	 <p>Which is the best estimate for the value of x?</p> <p>(A) 18 cm (B) 6.5 cm (C) 3.5 cm</p> <p style="text-align: right;">Answer: _____</p>	
2.	<p>Find the value of $103^2 - 9$.</p> <p style="text-align: right;">Answer: _____</p>	
3.	<p>A bag contains 3 red counters, 5 white counters and 2 black counters. Find the probability of drawing a counter which is not white.</p> <p style="text-align: right;">Answer: _____</p>	
4.	 <p>Point O is the centre of the circle. Find the $\angle BAC$.</p> <p style="text-align: right;">Answer: _____</p>	
5.	<p>The following shows the number of <i>Kitty Kola</i> bottles consumed in a school in a week.</p> <p style="text-align: center;">29 21 65 35 50</p> <p>Work out the mean.</p> <p style="text-align: right;">Answer: _____</p>	
6.	<p>A bank changes euro at the rate of 40 cents per euro. How many Maltese Liri will a tourist get for 250 euro?</p> <p style="text-align: right;">Answer: _____</p>	
7.	<p>Complete the following sequence:</p> <p style="text-align: center;">14 _____ 56 112</p>	
8.	 <p>In the diagram what is the value of x°?</p> <p style="text-align: right;">Answer: _____</p>	

9.	<p>Find the positive value of x given that $x^2 - 5 = 11$.</p> <p style="text-align: right;">Answer: _____</p>	
10.	 <p>The area of the parallelogram ABCD is 36 cm^2. X is the midpoint of AB. Find the area of the triangle BCX.</p> <p style="text-align: right;">Answer: _____</p>	
11.	<p>A television set costs Lm100 without VAT. In a sale its price is reduced by 10% and 10% VAT is added to the new price. Find the price, including VAT, of the television set.</p> <p style="text-align: right;">Answer: _____</p>	
12.	<p>Write 31700000×100 in standard form.</p> <p style="text-align: right;">Answer: _____</p>	
13.	<p>Estimate the area of a circle of radius 10 cm.</p> <p style="text-align: right;">Answer: _____</p>	
14.	 <p>The equation of the line shown is $y = mx + 1$. Find m given that the point P(3, 7) lies on the line.</p> <p style="text-align: right;">Answer: _____</p>	
15.	 <p>Write $\tan x$ as a fraction in its simplest terms.</p> <p style="text-align: right;">Answer: _____</p>	
16.	<p>When a number is divided by 3, the remainder is 2. The number divides exactly 165. Find the largest possible value of this number. (Hint: write 165 as a product of its prime factors.)</p> <p style="text-align: right;">Answer: _____</p>	

17.	<p>Which of the following is the correct value of $36^{-1/2}$?</p> <p>(A) 12 (B) 6 (C) $\frac{1}{6}$ (D) 2.5</p> <p>Answer: _____</p>	
18.	<p>How many bottles of lemonade each containing 1.5 litres can be filled from a barrel containing 300 litres of lemonade?</p> <p>Answer: _____</p>	
19.	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;">  </div> <div> <p>The shape shown is a regular hexagon of side 2cm. What is the length of the diagonal shown?</p> <p>Answer: _____</p> </div> </div>	
20.	<p>The point P(3, 4) is rotated clockwise by 90° about the origin. Which of the following are the coordinates of the transformed point?</p> <p>(A) P'(0, 3) (B) P'(-4, 3) (C) P'(4, -3)</p> <p>Answer: _____</p>	

End of paper



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FORM 4

MATHEMATICS – Scheme A
(Main Paper)

TIME: 1h 40min

1	2	3	4	5	6	7	8	9	10	11	12	13	NC	Main	Total

Name: _____

Class: _____

**Calculators are allowed but the necessary working must be shown.
Answer all questions.**

1. Find the value of x in each case:

(i) $x^3 = 64$

(ii) $3^x = 243$

(iii) $7^x = \frac{1}{7}$

Answer: _____

Answer: _____

Answer: _____

(3 marks)

2. Work out the following giving your answer in standard form:

(i) $(0.226 \times 10^5) \div (5 \times 10^{-3})$

(ii) $0.226 \times 10^3 + 50 \times 10^{-2}$

Answer: _____

Answer: _____

(4 marks)

3. Factorise completely:

(i) $2x + 8x^2$

(ii) $25 - 9x^2$

Answer: _____

Answer: _____

(4 marks)

4. The price of a flat was Lm 50,000 in 2004. The value of the flat went up by 10% each year. Work out:

(i) the price of the flat in 2005,

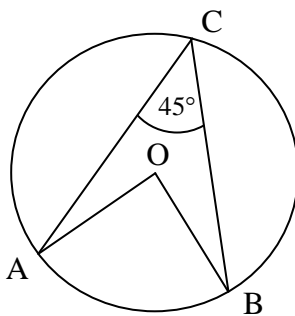
Answer: _____

(ii) the price of the flat in 2006.

Answer: _____

(5 marks)

5.



O is the centre of a circle. The length of the minor arc AB is 13 cm and $\angle ACB = 45^\circ$.

(i) State the size of $\angle AOB$.

Answer: _____

Work out giving your answer correct to 2 d.p:

(ii) the radius of the circle,

Answer: _____

(iii) the area of the minor sector AOB.

Answer: _____

(6 marks)

6. Solve the equation $\frac{x}{2} = 1 + \frac{3}{2x}$.

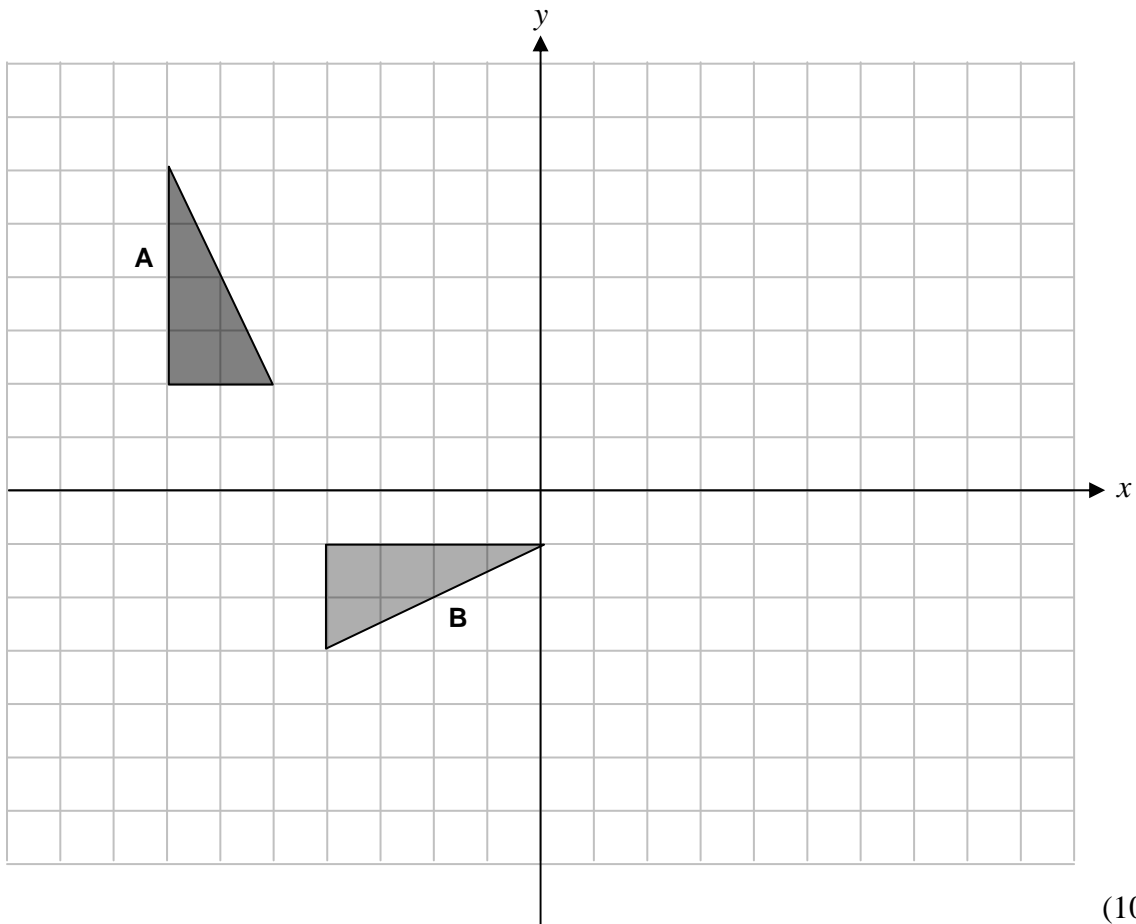
Answer: _____

(4 marks)



7. (a) Reflect B in the y-axis. Label the resulting triangle C.
- (b) Translate triangle B by $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$. Label the resulting triangle D.
- (c) Enlarge triangle D about the origin by a scale factor of two. Label the resulting triangle E.
- (d) Triangle B is obtained by rotating triangle A an angle of 90° clockwise about a point. Find the coordinates of this point and label it P.

Answer: P(,)



(10 marks)

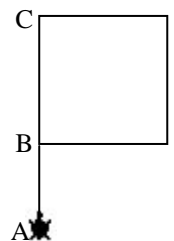
8. (a) The flag shown on the right consists of a square with a line AC attached to it as shown. $BC = 100$ turtle steps. $AB = 50$ turtle steps. Complete the following LOGO program which draws the flag.

TO FLAG

FD _____

_____ 4[FD 100 RT ____]

END



- (b) What command must be inserted after TO FLAG and before FD, so that the flag is drawn rotated clockwise by 60° about A?

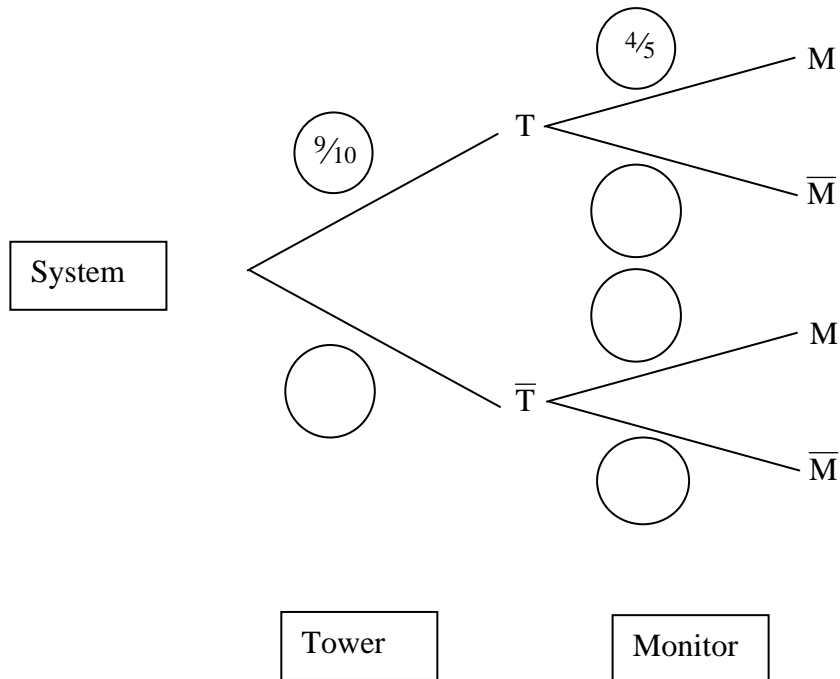
Answer: _____

(4 marks)

9. The probability $P(T)$ that a computer tower works perfectly is $\frac{9}{10}$ and the probability $P(M)$ that a monitor works perfectly is $\frac{4}{5}$. \bar{T} denotes a faulty tower and \bar{M} denotes a faulty monitor.

A man buys a computer system consisting of two parts, a tower and a monitor.

- (a) Complete the following tree diagram.



- (b) Find the probability that no part of the system has a fault.

Answer: _____

- (c) Find the probability that both the tower and the monitor have a fault.

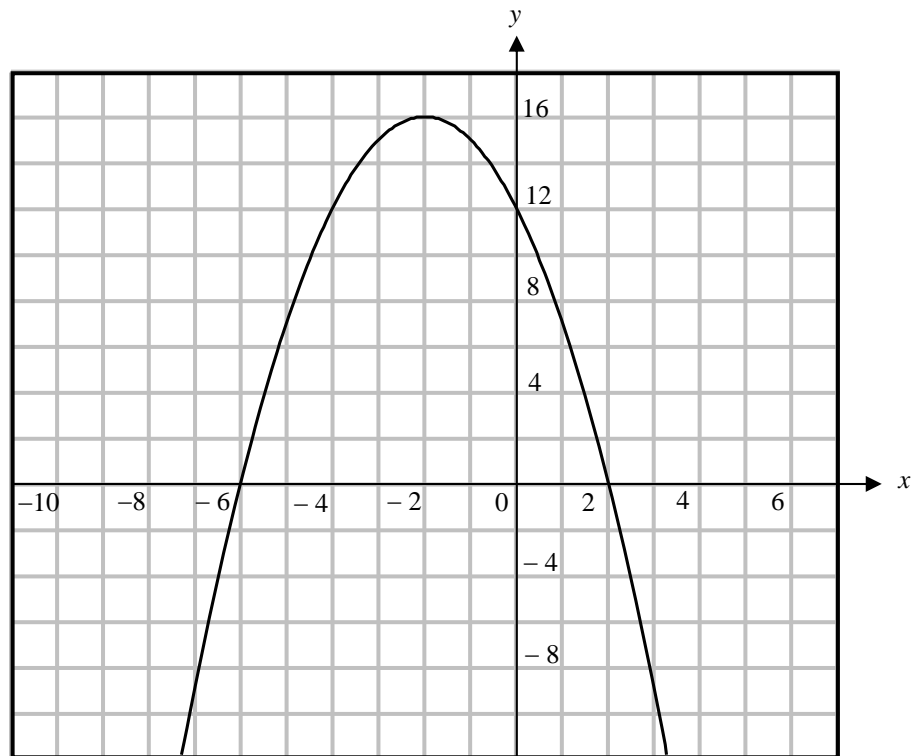
Answer: _____

- (d) Find the probability that **at least** one part of the system has a fault.

Answer: _____

(8 marks)

10. The graph of $y = c - 4x - x^2$ is shown below.
 (Scale: x axis: 1 square \equiv 1 unit y axis: 1 square \equiv 2 units)



- (a) Find the value of c from the graph.

Answer: _____

- (b) Use this graph to estimate the roots of the equation

$$8 - 4x - x^2 = 0$$

Answer: _____

- (c) Write down the equation of the line which passes through the point $(0, 4)$ and has a gradient of 1.

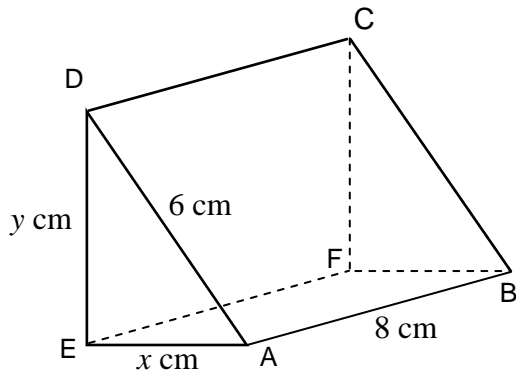
Answer: _____

- (d) Draw the graph of the line. Estimate, to one decimal place, the coordinates of the points where the line meets the curve.

Answer: (,) ; (,)

(9 marks)

11.



The diagram shows a prism with right-angled triangles ADE and BCF.

The face ABCD is a rectangle with area twice that of the rectangle ABFE. $AB = 8$ cm, $AD = 6$ cm.

(i) Work out the value of x .

Answer: _____

(ii) Work out the value of $\angle DAE$.

Answer: _____

(iii) Work out the value of y correct to 1d.p.

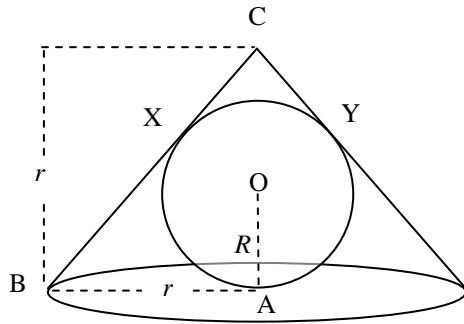
Answer: _____

(iv) Find the length of BD.

Answer: _____

(8 marks)

12.



The diagram shows a sphere inside a **right circular** cone.

The sphere fits exactly inside the cone with the sphere touching the base of the cone at A, and the side at X and Y.

The sphere has centre O and radius R . Its volume is $36000\pi \text{ cm}^3$.

The cone has vertex C, and the base radius r is equal to the vertical height AC.

- (i) Find the radius R of the sphere. (Volume of sphere $= \frac{4}{3} \pi R^3$)

Answer: _____

- (ii) State the size of $\angle CBA$.

Answer: _____

- (iii) By considering the triangle ABO find r correct to 1 d.p.

Answer: _____

(7 marks)

13. A CD player and a mobile cost 90 and 250 euro respectively. Mr. Caruana, a businessman, buys a number of CD players and mobiles from Paris. He tries to find the **cost in Lm** using a spreadsheet. He writes the following information:

	A	B	C	D
1	Euro per Lm			
2				
3	Item	Price	Quantity	Cost in Euro
4	CD	90	15	
5	Mobile	250	30	
6				
7	Total cost in Lm			

- (a) If he spent Lm 562.5 on the CD players use the information shown to fill in cell B1.

Answer: _____

- (b) What formulae should he write in cells D4 and D5?

Formula in cell D4: _____

Formula in cell D5: _____

- (c) What number should appear in cell B7?

Answer: _____

- (d) Mr. Caruana's shop assistant sells a mobile to a tourist for Lm 125. What is the profit in euro?

Answer: _____

(8 marks)

End of paper