SECONDARY SCHOOL
ANNUAL EXAMINATIONS 2008

DIRECTORATE FOR QUALITY AND STANDARDS IN EDUCATION
Educational Assessment Unit

A

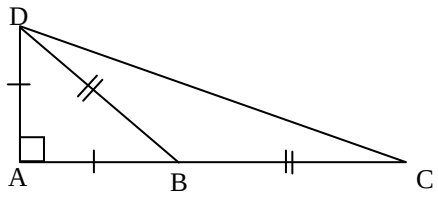
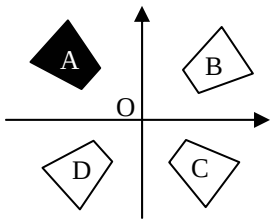
FORM 4 | **MATHEMATICS - SCHEME A** (Non Calculator Paper) | **TIME: 20 minutes**

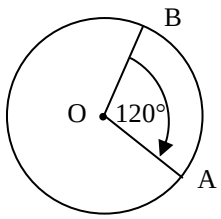
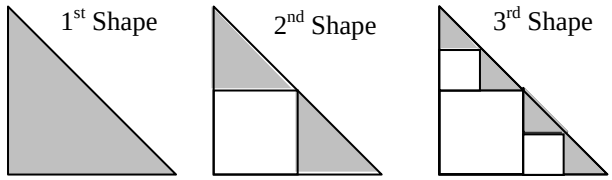
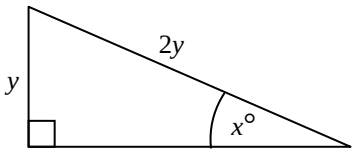
Name: _____ **Class**: _____

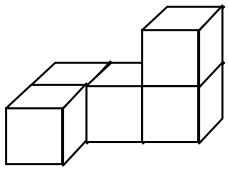
Mark

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.	Write 0.0012×100 in standard form. **Answer: _____**	
2.	The radius of a circle with circumference 50.272 is approximately: (A) 8 (B) 0.7 (C) 4 (D) 2.5 **Answer: _____**	
3.	The 2nd of May falls on a Monday. On what day will the 23rd of May fall? **Answer: _____**	
4.	 Given that AB = AD and DB = BC, find the ∠DCB. **Answer: _____**	
5.	Write the value of x for which $2x + y = 3$ and $x - y = 6$. **Answer: _____**	
6.	 Complete the statement. When shape A is rotated clockwise by 180° about O shape _____ is obtained.	
7.	Mr. Zahra gave a test to 10 students. The average mark was 30. Nine students obtained a total of 250 marks. What was the other student's mark? **Answer: _____**	
8.	A line passes through the points A(0, 3) and B(3, 0). State the value of y where the line cuts the y axis. **Answer: _____**	

9.	A computer costs €440 **including** 10% VAT. Find its price without VAT. **Answer:** _____	
10.	 The circle has radius 9m. Complete the statement: The minor sector AOB has area _____ π cm^2.	
11.	What is the number of shaded triangles in the 5th shape?  **Answer:** _____	
12.	One of these numbers is a prime number. Which one is it? (A) 492415 (B) 3000029 (C) 191938019 (D) 3919990 **Answer:** _____	
13.	Write down the value of $\sqrt{6400}$. **Answer:** _____	
14.	 Given that sin30° = 0.500 cos30° = 0.866 tan30° = 0.577 State the value of $x°$ in the figure. **Answer:** _____	
15.	Solve $p^2 - 2p + 1 = 0$. **Answer:** _____	

16.	A van is moving at a speed of 36km/hr. Its speed in metres per second is: (A) 70m/s (B) 36m/s (C) 12.5m/s (D) 10m/s **Answer: _____**	
17.	Draw the shape which the following LOGO program draws when run. **PD** **FD 200** **RIGHT 135 FD 50** **RIGHT 90 FD 50**	
18.	Given that €1 is equivalent to GBP 0.709 how many GBP will I get when I change €150 into GBP? **Answer: _____**	
19.	 Each cube has side 1cm. The surface area of the shape shown is: (A) $10cm^2$ (B) $20cm^2$ (C) $22cm^2$ (D) $15cm^2$ **Answer: _____**	
20.	What is the probability of drawing a counter which is not red at random from a box containing 10 red, 5 blue and 5 black counters? **Answer: _____**	

END OF PAPER

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Educational Assessment Unit

A

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.

(a) $x(x - 4) = 0$

Answer: _____

(b) $\frac{x^2 + 3}{x + 3} = x$

Answer: _____

(4 marks)

2. (a) Express 0.005×192.15 in standard form.

Answer: _____

(b) Express $\frac{7.2 \times 10^{-5}}{2.0 \times 10^{-7}}$ in ordinary form.

Answer: _____

(4 marks)

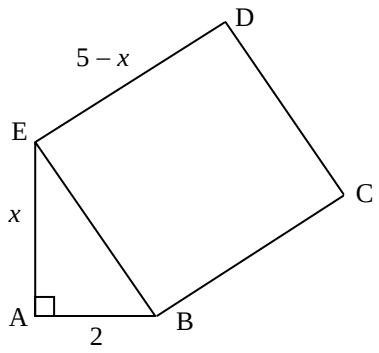
3. (a) Find the value of $\frac{u^2 - v^2}{w - v}$ given that $u = \sqrt{7}$, $v = 2$ and $w = 3$.

Answer: _____

(b) Make r the subject of the formula given that $p^2r - 2q = 1$.

Answer: _____

(4 marks)

4. 

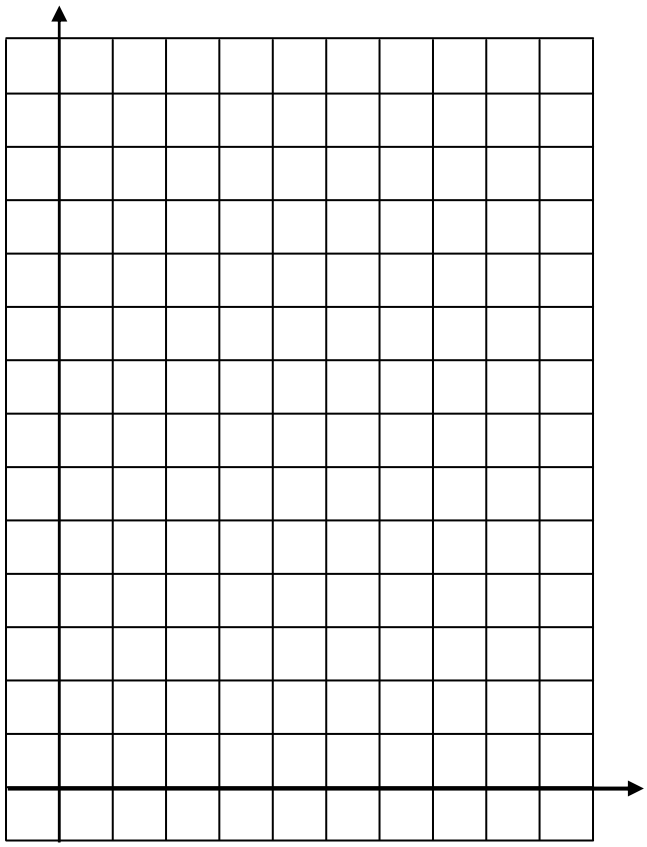
In the prism shown, ABE is a right-angled triangle. AB = 2cm and AE = x cm. The length DE = 5 – x cm.

(a) Write down the formula for the volume V of the prism in terms of x.

Answer: _____

(b) In the grid provided plot the graph of V against x for values of x from 0 to 5.
Scale: *x axis*: 2 squares ≡ 1 unit,
V axis: 2 squares ≡ 1 unit

x	0	1	2	3	4	5
V						



(c) Estimate the maximum value of V from your graph and state for what value of x this occurs.

Answer: V = _____ cm^3

x = _____ cm

(d) For what values of x is the volume $3.5cm^3$?

Answer: x = _____ , _____

(8 marks)

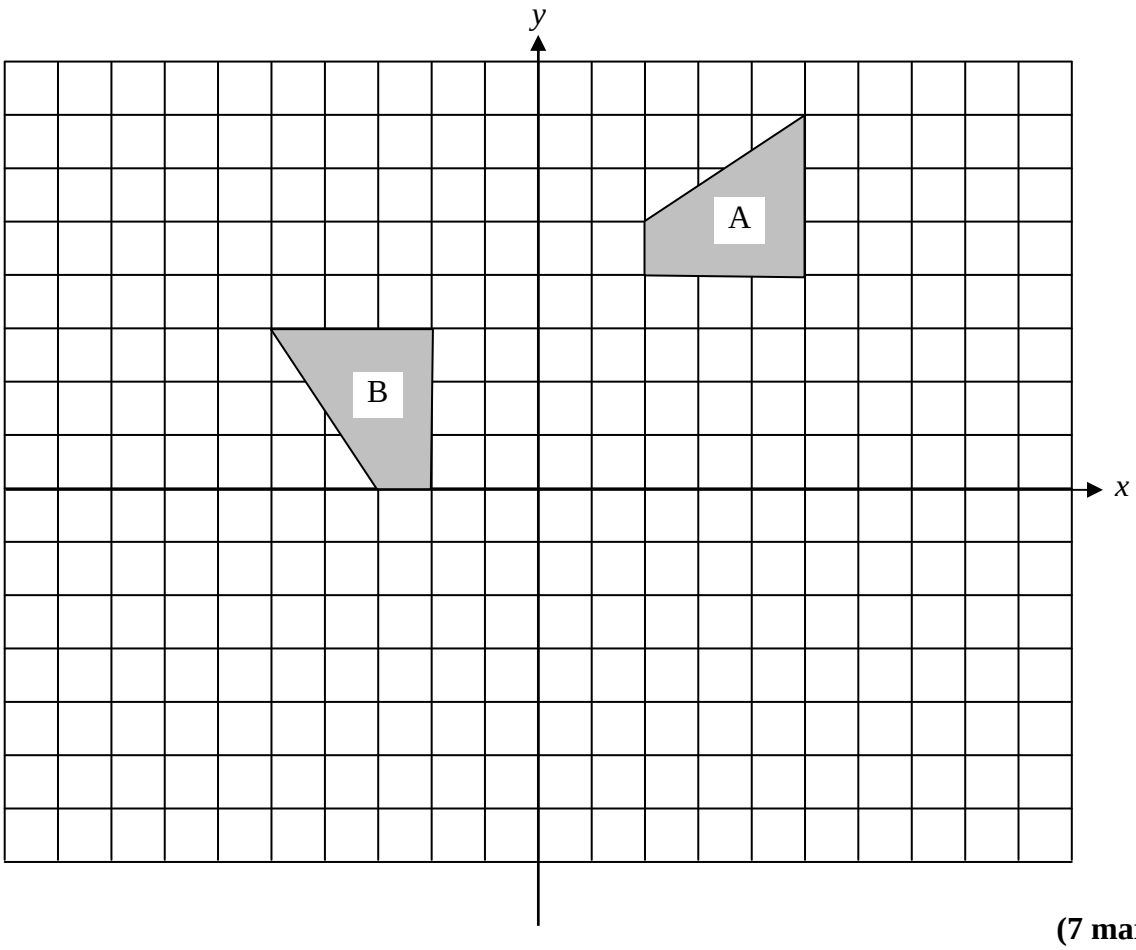
5. (a) Shape A is rotated anticlockwise by 90° about the point P to obtain shape B. State the coordinates of P.

Answer P(_____ , _____).

(b) Reflect shape B in the *y*-axis. Label the resulting shape C.

(c) Translate shape A by $\begin{pmatrix} 2 \\ -10 \end{pmatrix}$. Label the resulting shape D.

(d) Enlarge shape B using a scale factor of 2 and the origin as the centre of enlargement. Label the resulting shape E.



(7 marks)

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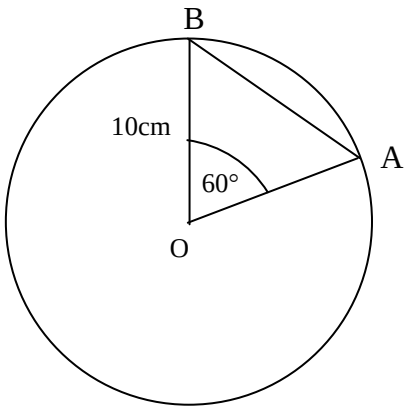
6. The circle has centre O and radius 10cm. Calculate correct to two decimal places:



(a) the area of triangle OAB.

Answer: _____

(b) the area of the minor segment AB.

Answer: _____

(5 marks)

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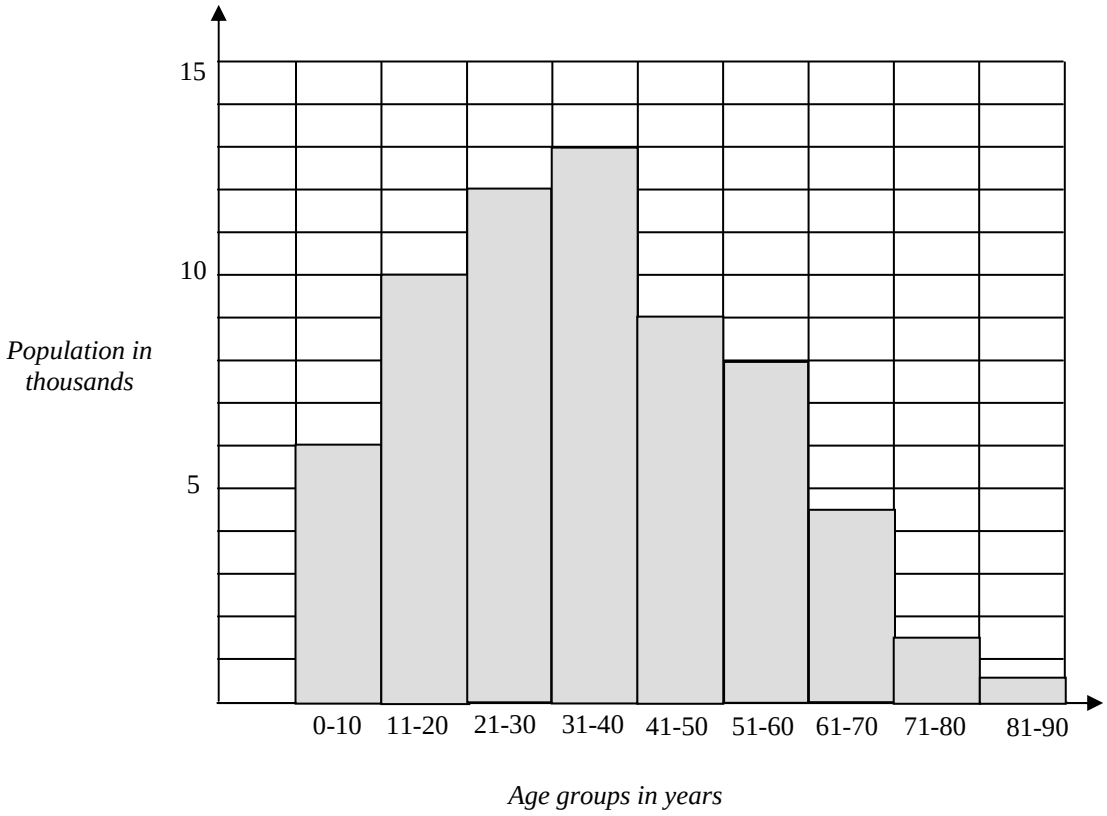
7. The following histogram represents the frequency and age group of the population in a city.



(a) Complete the table below:

Age group in years	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90
Frequency in thousands	6	10	12		9		4.5		0.5

(b) What percentage of the population is between the age of 21 and 60? Give your answer correct to the nearest whole number.

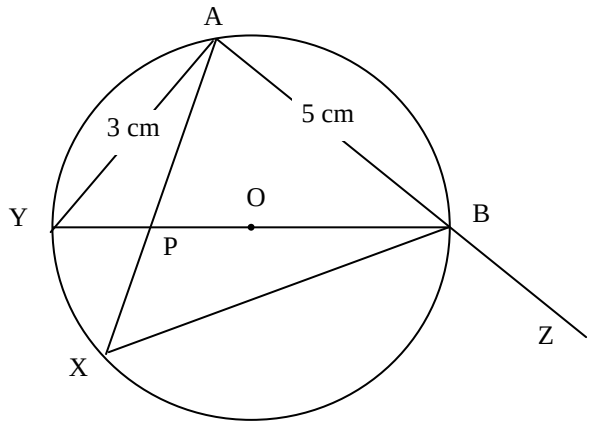
Answer: _____

(c) What is the probability that a person picked at random from the population is over the age of 60? Give your answer correct to one decimal point.

Answer: _____

(7 marks)

8. The circle shown has centre O.



(a) State, giving reason for your answer, the value of ∠BAY.

∠BAY = _____

Reason: _____

(b) Calculate ∠BYA to the nearest degree and hence state the value of ∠BXA giving reason for your answer.

Answer ∠BYA = _____

Hence ∠BXA = _____

Reason: _____

(c) Calculate the radius of the circle.

Answer: _____

(7 marks)

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9. A man invests €6800 at 9% per annum compound interest.

(a) What is the interest at the end of the first year?

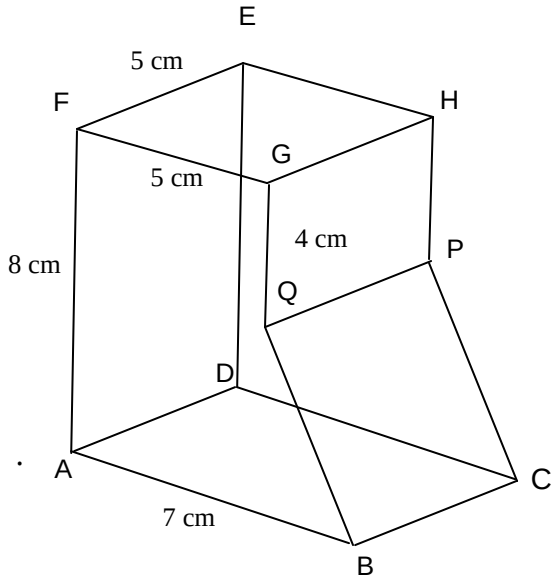
Answer: _____

(b) What is the interest at the end of the second year?

Answer: _____

(4 marks)

10.



In the figure shown, all the angles are right angles, except for ∠GQB which is equal to ∠HPC and ∠ABQ which is equal to ∠DCP.

(a) Find the area of face ABQGF.

Answer: _____

(b) Work out the volume of the solid.

Answer: _____

(c) Calculate the size of ∠ABQ to the nearest degree.

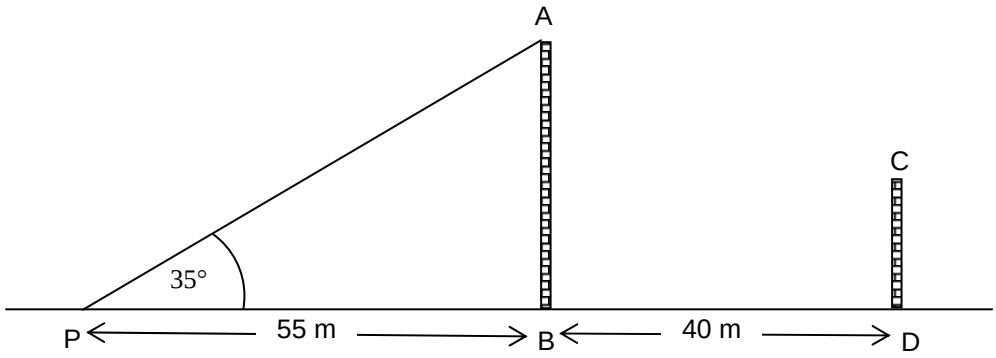
Answer: _____

(d) What is the radius *R* of the sphere which has the same volume as the above solid? (The volume of a sphere is $\frac{4}{3}\pi R^3$). Give your answer correct to one decimal place.

Answer: _____

(8 marks)

11.



(a) A tower AB is twice as high as another tower CD. Both towers lie on the same horizontal ground. P is a point on the ground 55 m away from the foot of tower AB. The angle of elevation from P of the top of the tower AB is 35°. The distance between the two towers is 40 m.

(i) Find the height of the tower AB**.**

Answer: _____

(ii) Find the angle of depression from the top of the tower AB to the top of the tower CD.

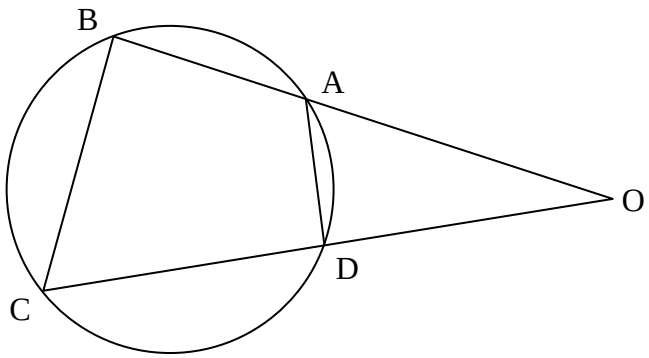
Answer: _____

(b) Another point Q is on the same horizontal ground due south of D and 40 m away from it. B is due west of D. Calculate, to the nearest degree, the angle of elevation of A from Q.

Answer: _____

(8 marks)

12.



(a) Use the above figure to complete the following, giving reasons for your answers:

(i) $\angle OAD = \angle$ _____ (_____)

(ii) $\angle ODA = \angle$ _____ (_____)

(b) Explain why the triangles OAD and OBC are similar.

_____

_____

_____

(c) Given that AD: BC = 1:2, complete the statement:-

area of ΔOAD : area of ΔOBC = ____**:**_____

(7 marks)

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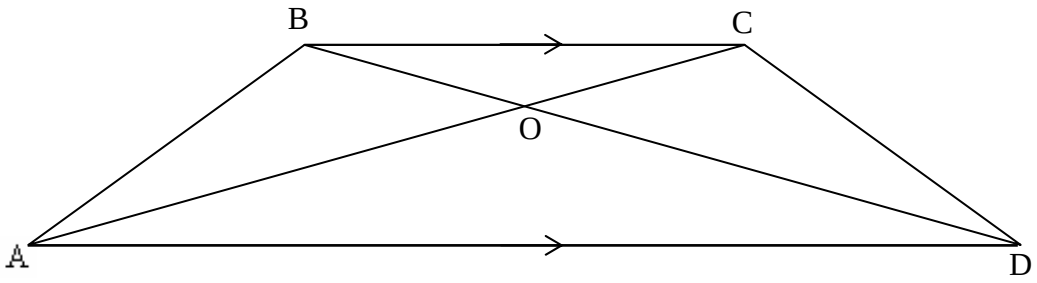
13. In the figure shown OB = OC and BC is parallel to AD.



(a) Explain why in triangle AOD, AO = OD.

(b) Prove that triangles AOB and DOC are **congruent**.

(7 marks)

End of paper