**NAME** ……………………………………….…… **ADM NO**……….… **DATE** …….………

**SCHOOL**…………………………………………...……… **SIGNATURE** …………...……….

121

MATHEMATICS

FORM 3

TIME: 2 ½ HOURS

**END OF TERM TWO EXAMINATION**

**Kenya Certificate of Secondary Education**

**INSTRUCTIONS TO CANDIDATES**

1. *Write your name and admission number in the spaces provided at the top of this page.*
2. *This paper consists of two sections:* **Section I and Section II.**
3. *Answer* ***al****l questions in* **section I** and any five questions in Section **II.**
4. *Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.*
5. *Marks may be given for correct working even if the answer is wrong.*
6. ***KNEC*** *Mathematical tables may be used.*

**For Examiner’s Use Only**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **Total** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** |
|  |  |  |  |  |  |  |  |

**Grand**

**Total**

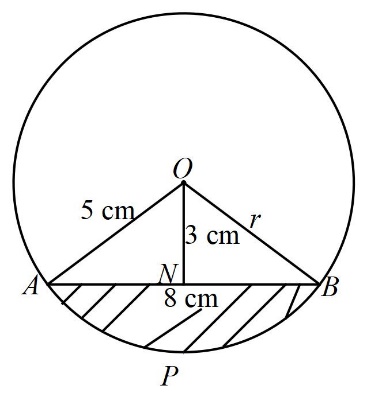
**SECTION I (50 marks)**

1. Without using a calculator evaluate (3 marks)

1. Simplify the expression. (3 marks)
2. Solve the equation for (3 marks)
3. The sum of the interior angles of a regular polygon is . Find the size of each exterior angle

(3 marks)

1. In the figure below the shaded region is a segment of the circle with Centre O and radius r. , , angle AOB =.



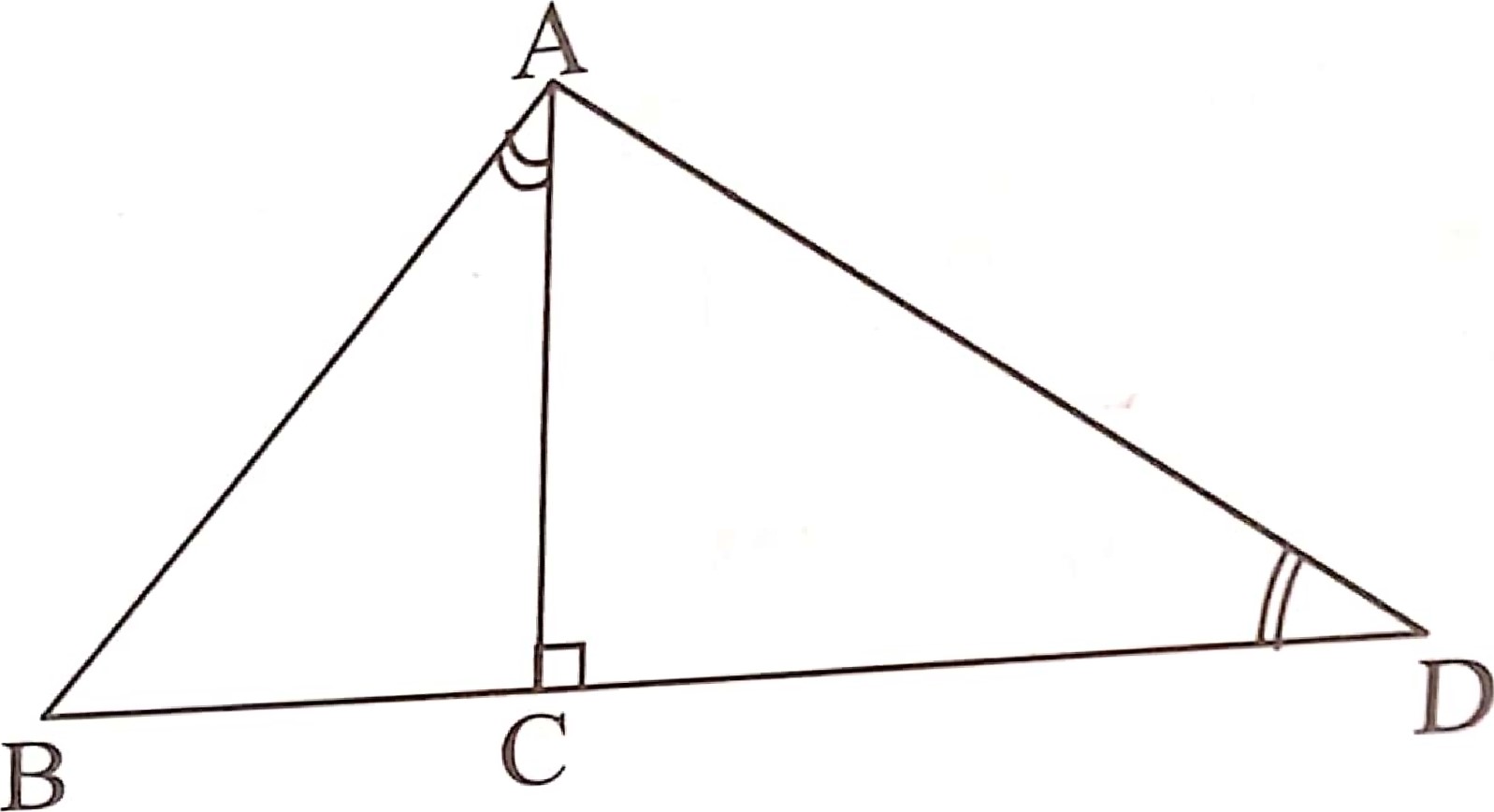
Find the area of the shaded part. (4 marks)

1. Simplify the expression leaving your answer in the form where a, b and c are integers. (3 marks)
2. By use of a quadratic formula solve the equation (3 marks)
3. Solve for in the equation (3 marks)

=64

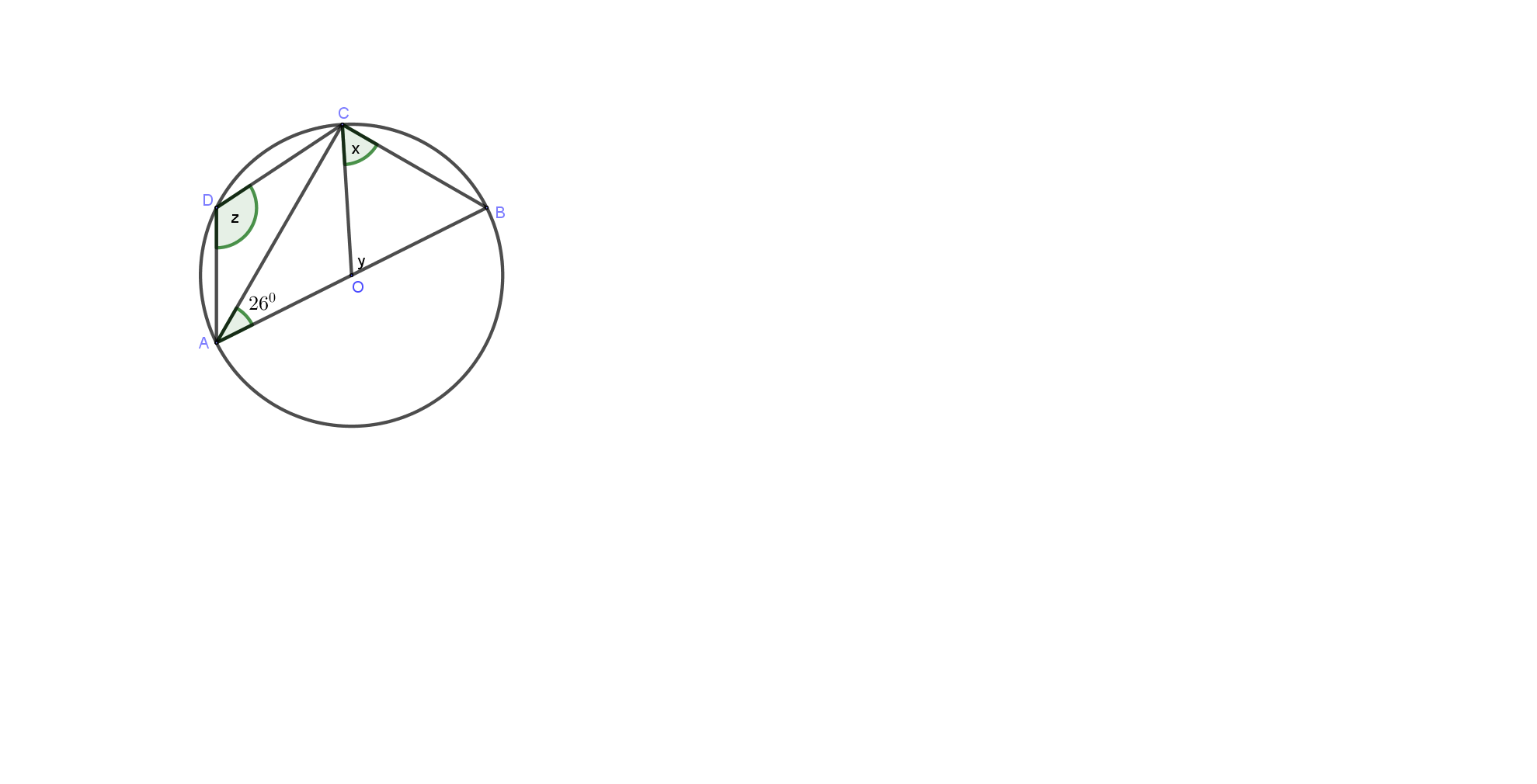
1. Use logarithms correct to 4 decimal places to evaluate; (4 marks)
2. Make H the subject of the formula (3 marks)

1. In the figure below angle BAC and ADC are equal. Angle ACD is a right angle. The ratio of the sides . Given that area of triangle ABC is 24 cm2, find the area of triangle ACD. (3 marks)



1. Evaluate without using a calculator or a mathematical table, (3 marks)

1. In the figure below O is the centre .Calculate the angles marked , and (3 marks)



1. The exchange rate in January 2000 was US $ 1 = Ksh 75.60 and UK £1 = Ksh 115.80.

A tourist came to Kenya with US $ 5000 and out of it spent ksh.189,000. He changed the balance in UK£. How many pounds did he receive? (3 marks)

1. The length and width of a rectangle are given to the nearest 0.1 cm as 18.5 cm and 12.4 cm respectively. Calculate the percentage error in the area of the rectangle. (3 marks)
2. Solve the following inequalities and hence state the integral values that satisfy the inequalities. (3 marks)

**SECTION II (50 Marks)**

1. (a) L1 is a line which passes through , and . Find the equation of the line and the value of h. (3 marks)

(b) Equation of L2 is and it intersects line L1 at point A. Find the co-ordinates of A. (2 marks)

(c) B is on line L1. Find p hence find the length of AB. (2 marks)

(d) C is on the line L2. Find t. It is given that the line L3 passes through C and parallel to L1. Find the equation of L3  (3 marks)

1. The table below shows the rates of taxation in a certain year.

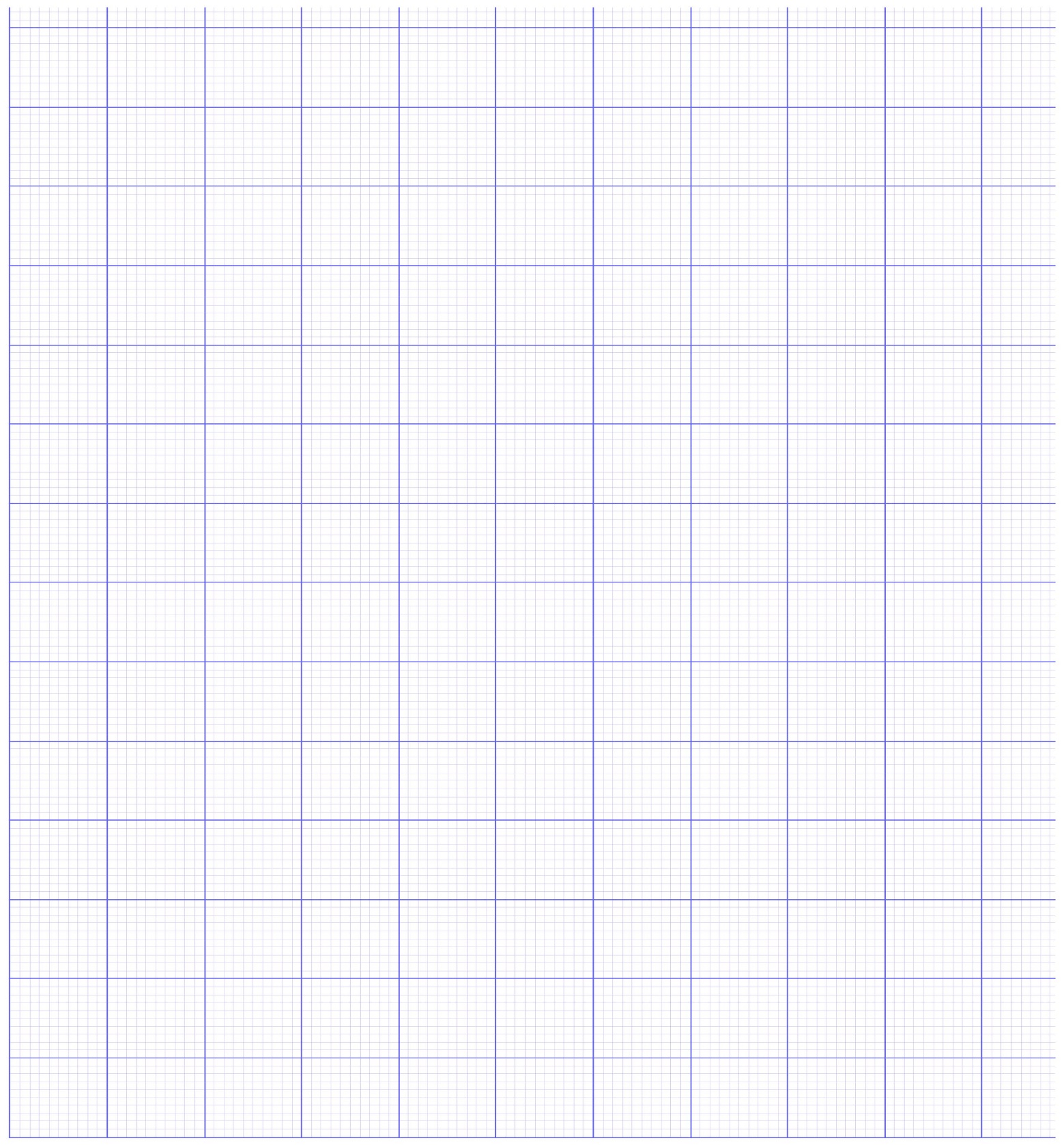
|  |  |
| --- | --- |
| Income in K£ p.a | Rates in Ksh per K£ |
|  | 2 |
|  | 3 |
|  | 4 |
|  | 5 |
|  | 7 |
|  | 9 |

In that year, Juma was earning a basic salary of Ksh. 41 000 per month. In addition he was entitled to a house allowance of Ksh. 13 000 p.m. and a personal relief of Ksh. 1056 p.m.

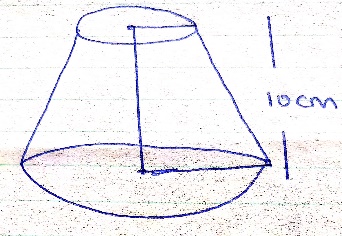
1. Calculate Juma’s taxable income in K£ per annum. (2 marks)
2. How much tax did he pay per month? (5 marks)
3. His other deductions per month included: Sacco contribution of Ksh 4000 and loan repayment of Ksh 5 500. Calculate Juma’s net salary. (3 marks)
4. The distance between towns A and B is 360km .A minibus left town A at 8.15a.m and travelled towards town B at an average speed of 90km/hr .A matatu left town B two and a third hours later on the same day and travelled towards town A at an average speed of 110km/hr.
5. (i) At what time did the two vehicles meet (4 marks)

(ii) How far from town A did the two vehicles meet (2 marks)

1. A motorist started from his home at 10.30 a.m. on the same day as the matatu and travelled at an average speed of 100km/hr .He arrived at B at the same time as the minibus .Calculate the distance from A to his house. (4 marks)
2. A triangle ABC with vertices and undergoes enlargement scale factor and centre to produce triangle .
3. On the grid provided draw triangle ABC and its image , state the co-ordinates of (4 marks)



1. Triangle is the reflected in the line to give . Draw triangle and state the co-ordinates of its vertices. (3 marks)
2. If triangle is mapped onto a triangle whose co-ordinates are , and by a rotation, find the centre and angle of rotation. (3 marks)
3. Three quantities R, S and T are such that R varies directly as S and inversely as the square root of T.
4. R = 480 when S = 150 and T = 25.Write an equation connecting R, S and T. (4 marks)
5. Find;
6. The value of R when S = 360 and T = 2.25. (2 marks)
7. The percentage change in R if S is increased by 5% and T decreased by 15.36%. (4 marks)
8. The diagram below represents a lampshade in the form of an open-ended frustum of a cone. Its bottom and the top diameters are 14cm and 7cm respectively. Its height is 10cm. Use ()

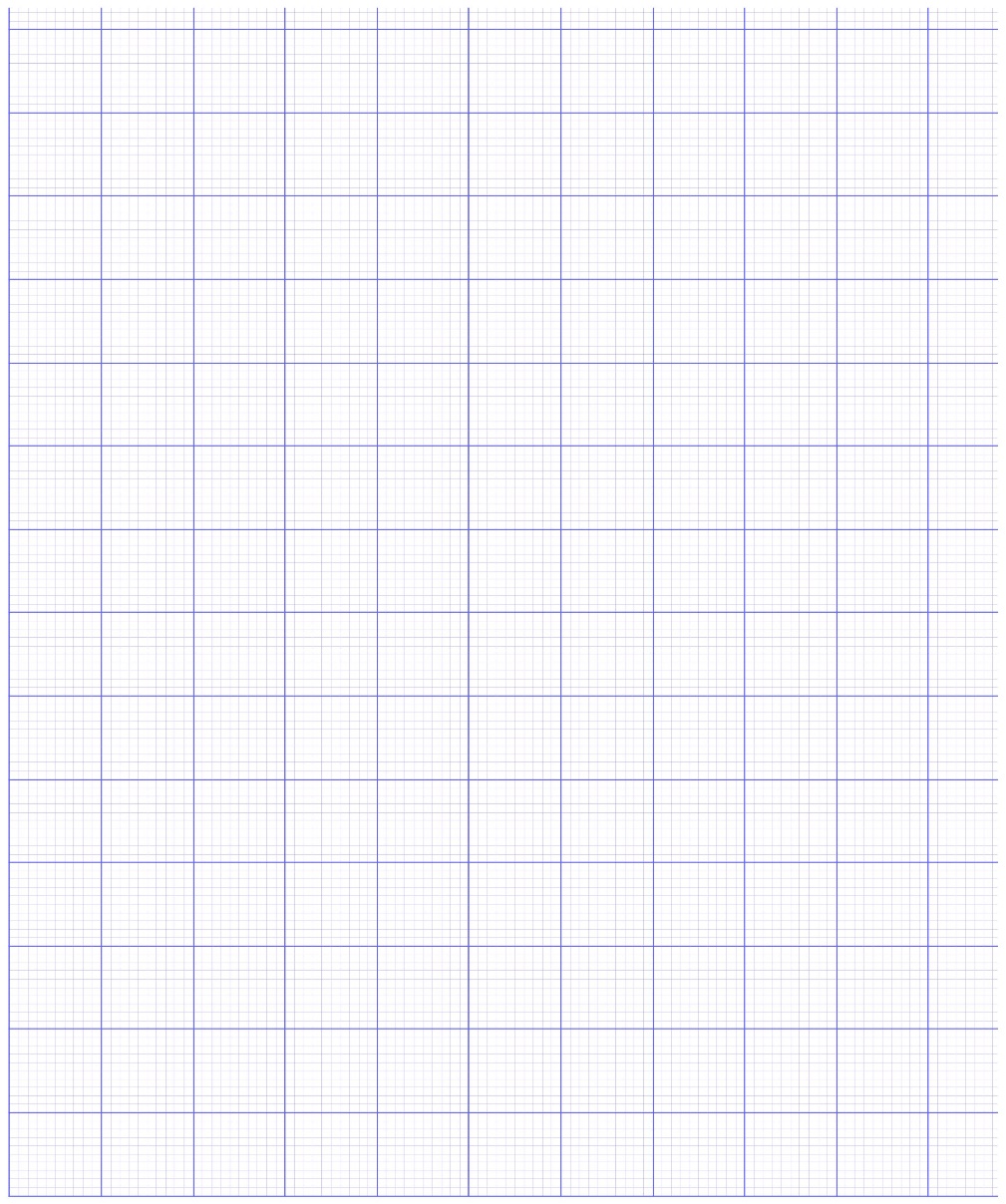


* + 1. Find

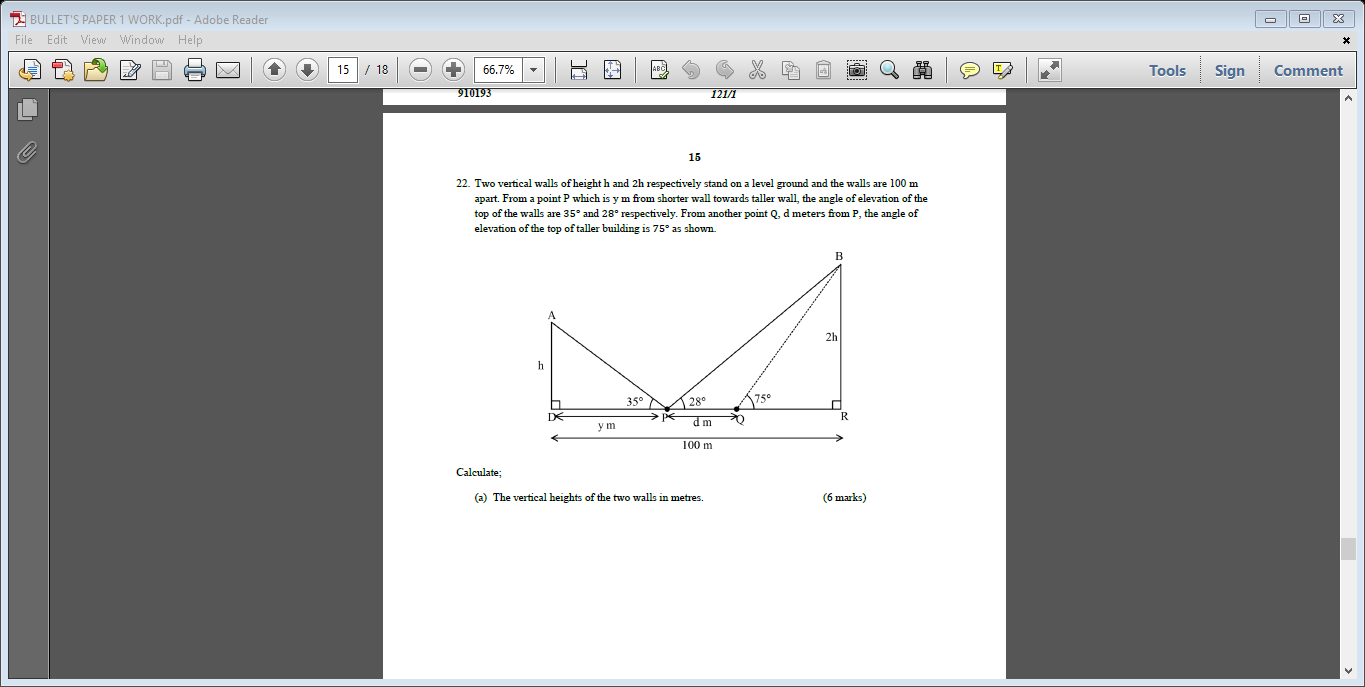
1. The height of the cone from which the frustum was cut. (2 marks)
2. The area of the curved surface of the frustum (5 marks)
   * 1. The material used for making the lampshade is sold at Shs.800 per square metre. Find the cost of 10 lampshades if a lampshade is sold at twice the cost of the material. (3 marks)
3. The table below shows the mass of 60 women working in hotels

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Mass (Kg) |  |  |  |  |  |  |
| No. of women | 8 | 14 | 18 | 15 | 3 | 2 |

1. State:
2. The modal class (1 mark)
3. The median class (1 mark)
4. Estimate the mean mark (4 marks)
5. Draw a histogram for the data (2 marks)



1. Two vertical walls of height h and 2h respectively stand on a level ground and the walls are 100m apart. From a point P which is y m from the shorter wall, the angles of elevation of the top of the walls are and respectively. From another point Q, d metres from P, the angle of elevation of the top of the taller building is as shown.



Calculate;

1. The vertical heights of the two walls. (6 marks)
2. The distance PQ in metres correct to 1 decimal place. (4 marks)