

1. (a) Daya plucked mangoes from a tree in her compound and sent  $\frac{1}{4}$  of the mangoes to her brother and another  $\frac{1}{4}$  to her sister. Then she distributed  $\frac{1}{3}$  among the neighbours while she kept the balance for herself.
- What fraction of the whole lot was sent to the brother and sister?
  - What fraction of the whole lot is kept for herself?
  - If Daya had 93 mangoes as her share, find the total number of mangoes plucked.
- (b) Geetha invested Rs. 3 200 in a company to buy Rs. 10 shares at Rs. 8. The company pays a 6% dividend.
- How many shares did she buy?
  - What is the nominal value of these shares?
  - Find the annual income she gets.
  - What percentage of the invested amount is this income?

2. (a) Find the value of  $\left(\frac{8}{125}\right)^{\frac{1}{3}}$
- b) If  $\log_{10} x + \log_{10} 2 = \log_{10} 6$  Find the value of  $x$ , without using logarithmic tables.

- (c) Using logarithmic tables find the value of  $\frac{15.3 \times (3.72)^3}{18.62}$  Correct to the nearest whole numbers.

3. (a) Factorise  $4x^2 - 25$
- (b) Solve:  $2x + 5y = -4$   
 $x + 4y = -5$
- (c) solve:  $2x^2 - 5x = x^2 + 24$

4. Using a straight edge, a pair of compasses and a cm/ mm scale construct a geometric figure which satisfies the data given below. All construction lines should be shown clearly.

- Draw a line segment AB of length 7.5cm.
- Find the point P so that  $\angle BAP = 90^\circ$  and  $AP = 4$  cm
- Construct a line through P parallel to AB
- Draw the bisector of  $\angle PAB$ . Let this bisector and the parallel line drawn through P meet at a point. Name this point as C
- Complete the triangle ABC and using the protractor measure the angle ABC and write down its value.
- Construct the circle whose centre lies on the line AB and passes through the points B and C.
- Name the centre of the circle as O then measure the radius and write down its value.

5. (a) An incomplete table of values of  $x$  and  $y$  for drawing the graph of the function  $y = x^2 - 4x + 2$  is given below.

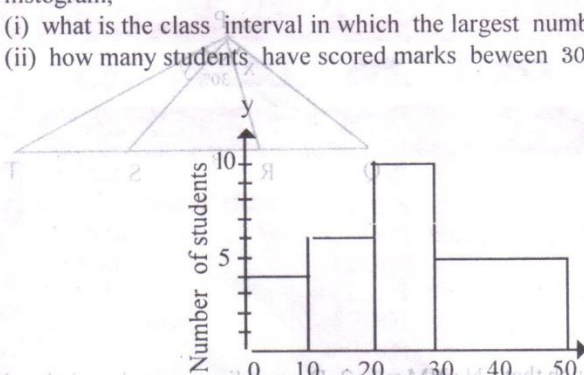
x	-1	0	1	2	3	4	5
y	7	.....	-1	.....	-1	2	7

- Copy the above table on to your answer script and fill in the blanks.
  - Taking a scale of 10 small divisions along the  $x$  - axis and the  $y$  - axis to represent **one unit** draw the graph of the above function on the graph paper provided.
- (b) Using you graph,
- write down the coordinates of the vertex of the graph.
  - write down the range of values of  $x$  for which the function is negative.
  - write down the minimum value of the function
  - Find the roots of the equation  $2 + 4x - x^2 = 0$



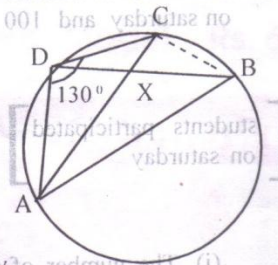
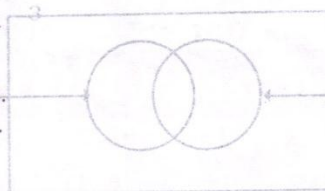
- (b) Histogram given here represents the marks for mathematics scored by 30 students in a class. According to this histogram,

- (i) what is the class interval in which the largest number of students have scored marks?  
 (ii) how many students have scored marks between 30 - 50?



9. Four points A, B, C, and D lie on a circle. AB is diameter of the circle.  $\angle ADC = 130^\circ$ . AC and BD intersect at X. Copy the diagram on your answer script and answer the following questions.

- (i) Name a right angle. Give reasons.  
 (ii) Find the value of  $\angle BDC$ .  
 (iii) Find the value of  $\angle ABC$ . Give reasons.  
 (iv) If  $AD = DC$  Find the value of  $\angle DAC$ .  
 (v) Prove that  $\angle ABX + \angle CDX = \angle CXB$ .



10. (a) The second and third terms of an arithmetic progression are 2 and 5 respectively.  
 (i) Find the common difference.  
 (ii) Write down the fourth term.  
 (iii) Find the first term.  
 (iv) Find the sum of the first 20 terms of the above progression.

- (b) The sum of the first and second terms of a geometric progression is 15. The common ratio of the progression is 2. Find  
 (i) the first term  
 (ii) the seventh term of this progression.

11. (a) There are two blocks of land, one a square and the other a rectangular in shape. The perimeters of the two blocks of land are equal. The perimeter is 80 m.

- (i) Find the length of a side of the square block of land.  
 (ii) If the breadth of the rectangular land is half of that of the length of a side of the square land, find the length of the rectangular block of land.  
 (iii) Find the area of the rectangular land.

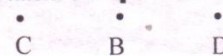
- (b) The base circumference of a cone is 44 cm and its perpendicular height is 24 cm

- (i) Find the base radius,  
 (ii) If the slant height is 25 cm, find the total surface area,  
 (iii) Find the volume of the cone.

- (c) The curved surface area of a cone of base radius  $r$ , perpendicular height  $h$  and slant height  $l = \pi r l$  volume of the cone =  $\frac{1}{3} \pi r^2 h$  take  $\pi = \frac{22}{7}$

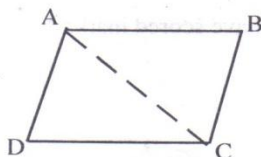
12. An electric post, 10 metres high is fixed vertically on level ground. On either side of its base B are two points C and D on the ground so that CBD is a straight line (see figure). Two wires are attached to a point A, 2 metres below the top of the electric post. The remaining ends of the two wires are attached to the points C and D such that the wires are taut.

- (i) If  $\angle ACB = 40^\circ 10'$  find the length of the wire AC.  
 (ii) If the length of the wire is 20 m, find  $\angle ADB$ .

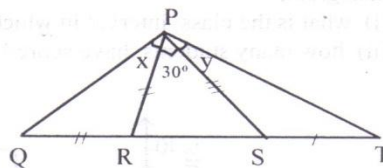




6. (a) In the given diagram  $AB \parallel DC$  and  $AD \parallel BC$  Prove that the triangles  $ABC$  and  $ADC$  are congruent.



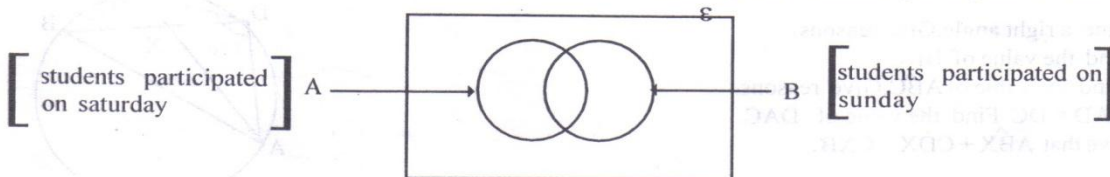
- (b) In the given diagram  $PR = RQ$  and  $PS = ST$   
 $\angle RPS = 30^\circ$  Let  $\angle QPR = x$  and  $\angle TPS = y$



- (i) Write down the value of  $\angle PRS$  in terms of  $x$   
 (ii) Find the value of  $(x + y)$ .

- (c) The point  $N$  on the side  $LM$  of the triangle  $KLM$  is such that  $LN : NM = 1 : 2$ , Draw a diagram and mark the given data on it. Find the ratio of the area of triangle  $KLN$  to the area of the area of triangle  $KLM$ .

7. (a) Grade eleven students of a certain school held on shramadana on saturday and sunday. 102 students participated on saturday and 100 students participated on sunday. 82 students participated on both days.



- (i) The number of students who participated on both days.  
 (ii) The number of students who participated only on saturdays.  
 (iii) The number of students who participated only on sunday.  
 (b) If the total number of students in Grade eleven is 124, find the number of students who could not participate in the shramadana even for a single day.  
 (c) The table below shows the information revealed in testing the standards of a stock of packets of salt kept for sale.

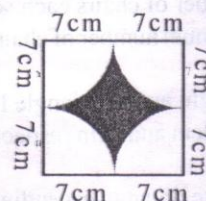
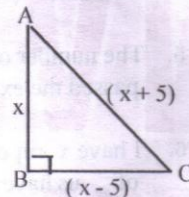
	Number of packets with the correct amount of iodine	Number of packets without the correct amount of iodine
Number of packets with the correct minimum weight	80	11
Number of packets without the correct minimum weight	07	02

- (i) How many packets of salt were tested? If a packet of salt was selected at random,  
 (ii) find the probability that it will be a packet with correct amount of iodine.  
 (iii) find the probability that it will be a packet with not conforming to the standards because it is without the correct minimum weight or without the correct amount of iodine.  
 8. (a) The frequency distribution given below shows the information late - attendance of workers in an institution on a particular day,

minutes late	mid value (x)	number of workers (f)	frequency x mid value (fx)
1 - 3		4	
4 - 6		5	
7 - 9		9	
10 - 12		12	
13 - 15		7	
16 - 18		3	

- (i) Copy the above table on your answer script and complete the  $x$  column and  $fx$  column.  
 (ii) How many workers were late on this particular day?  
 (iii) Calculate the mean of this distribution. (iv) Write down what is indicated by the sum of  $fx$  column.

21. Simplify  $\frac{x}{x+1} - \frac{x}{x(x+1)}$  .....
22. Simplify  $1101_{\text{two}} + 32_{\text{four}}$  .....  
(State the base of the number you get as the answer.)
23. What is the common ratio of the geometric progression  $a, 2a^2, 4a^3, \dots$ ? Find the sixth term of this progression.  
common ratio ..... 6<sup>th</sup> term .....
24. The side BC of an equilateral triangle ABC is produced to D such that  $BC = CD$ . Draw a rough sketch and mark this data. Find the value of  $\angle ADC$  . .....
25. A shop A gives a discount of 25% on selling an article whose marked price is Rs. 300. Another shop B gives a discount of 30% on selling an article of the same kind whose marked price is Rs. 310. From which shop will it be cheaper to buy this article? .....
26. In the given diagram, the lengths of the sides of the right angled triangle ABC are given in terms of  $x$ . Form a quadratic equation in  $x$  to express the relationship between the sides of the triangle. Find the length of AB by solving this equation.  
.....
27. In the given diagram four equal circular arcs are drawn by taking the vertices of the square as centres. Find the area of the shaded portion. ....



28. Show by a rough sketch that there are four points which are at a distance of 2 cm from the given line AB and 3 cm from the point A.
29. Using the given diagram verify that  $\sin(90^\circ - \theta) = \cos \theta$
30. The given diagram shows a triangle ABC and one of its excircles. If  $AE = 13$  cm, find the perimeter of the triangle ABC.

