

Second Terminal Examination 2012

Mathematics

1) Sum of angles in a polygon =  $(n-2) 180^{\circ}$   
=  $(8-2) 180^{\circ}$   
=  $6 \times 180^{\circ} = 1080^{\circ}$

Measure of one angle =  $\frac{1080}{8} = 135^{\circ}$

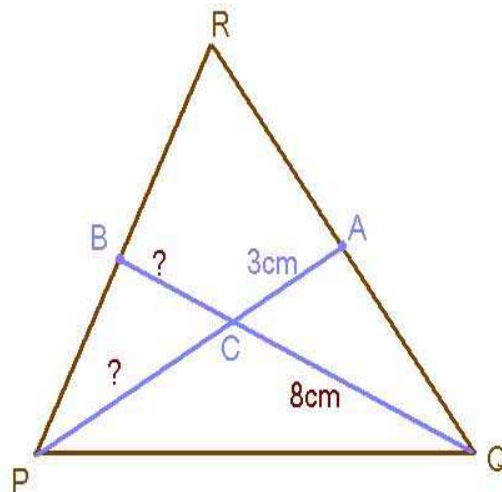
2) Measure of one external angle =  $120^{\circ}$

Number of external angles =  $\frac{360}{120} = 3$

Number of sides = 3

The given polygon is equilateral triangle

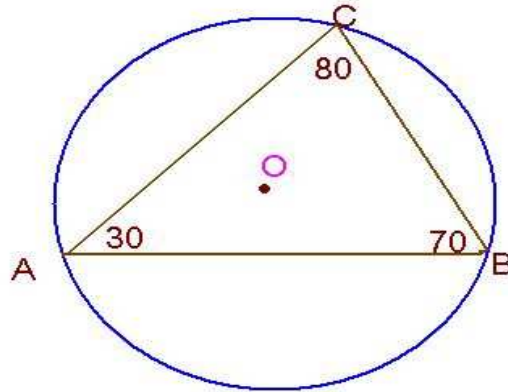
3)



$PC : AC = 2:1$  ,  $AC=3\text{cm}$  hence  $PC = 6\text{cm}$

$QC : BC = 2:1$  ,  $QC=8\text{cm}$  hence  $BC = 4\text{cm}$

4)



AB is the largest chord of the circle and BC is the smallest chord. Distance from the centre increases length of chord decreases hence the side BC is farthest from the centre of the circle.

5) Let the price of one Orange = 'x' and price of one apple be 'y'

Then  $5x+2y = 125$ ----- (1)

$$2x+3y = 105$$
----- (2)

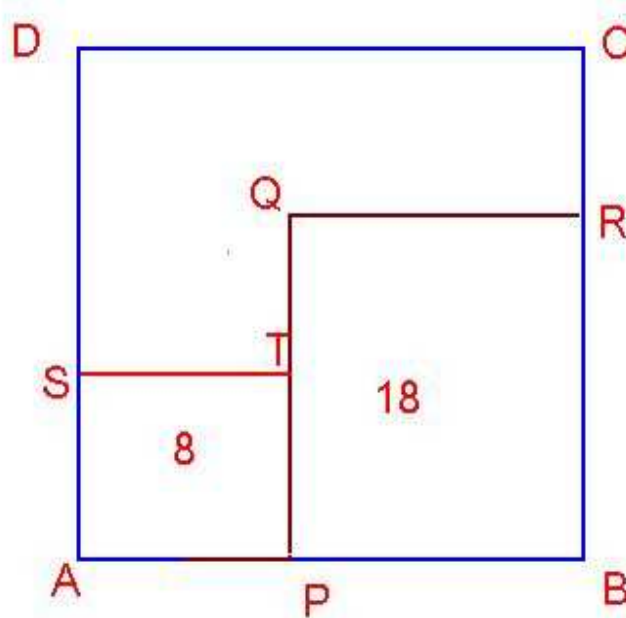
6)

$$\frac{x}{y} = \frac{5}{7}$$

$$7x = 5y$$

$$\frac{7x+3y}{7x-3y} = \frac{5y+3y}{5y-3y} = \frac{8y}{2y} = 4$$

7)



$$AP^2 = 8 \quad , \quad AP = \sqrt{8}$$

$$BP^2 = 18 \quad , \quad BP = \sqrt{18}$$

$$AB = \sqrt{8} + \sqrt{18} = 2\sqrt{2} + 3\sqrt{2} = 5\sqrt{2}$$

$$\text{Total area of cultivation land} = 5\sqrt{2} \times 5\sqrt{2} = 50 \text{ ചെറുസമീ}$$

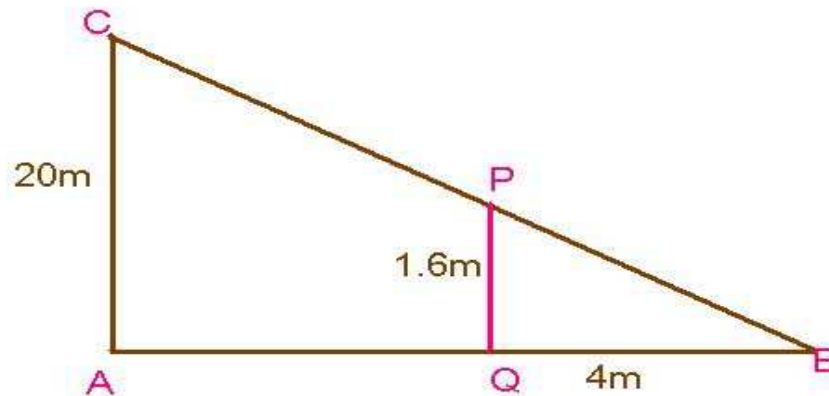
8)

$$\text{Mean} = \frac{324.8}{10} = 32.48$$

$$\text{Median} = 30.6$$

$$\text{Mode} = 30$$

9)



$$\angle A = \angle Q = 90^\circ$$

$\angle B$  is a common angle for  $\triangle ABC$  and  $\triangle QBP$

Hence  $\triangle ABC$  and  $\triangle QBP$  are similar. In similar triangles sides opposite to equal angles are proportionate

$$AC : PQ = AB : QB$$

$$20 : 1.6 = AB : 4$$

$$1.6 AB = 80$$

$$AB = 80/1.6 = 50\text{m}$$

$$AQ = 50 - 4 = 46\text{m}$$

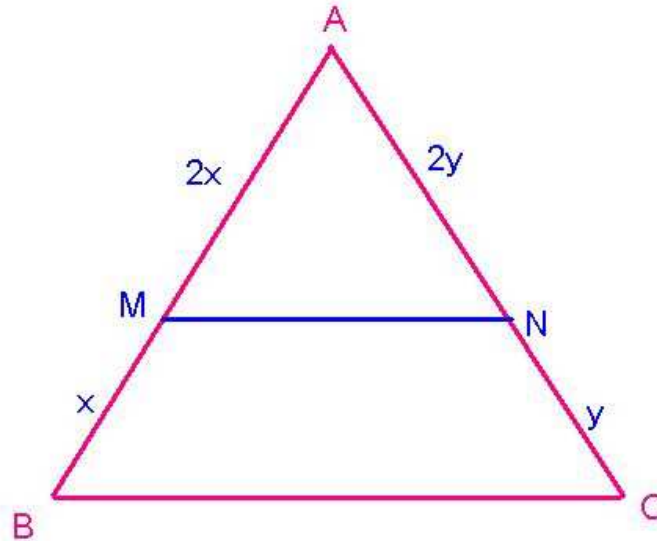
The person is 46m away from the foot of the post

10)

Let breadth of the rectangle = 'x' then length is 'x+3'

$$\text{Perimeter} = 2(x+3+x) = 2(2x+3) = 4x+6$$

11)



It is given as MN divides AB and AC in the ratio 2:1

Let MB='x' then AM=2x in the same way if NC='y' then AN=2y

Consider  $\Delta ABC$  and  $\Delta AMN$

$$AB:AM = 3:2$$

$$\text{Also } AC:AN=3:2$$

$\angle A = \angle A$  (Common angle)

Hence  $\Delta ABC$  and  $\Delta QBP$  are similar. In similar triangles sides opposite to equal angles are proportionate

Given as  $MN=10$  cm

$$BC:MN = 3:2$$

$$BC:10 = 3:2$$

$$2BC = 30 \text{ and } BC=15\text{cm}$$

$$\begin{aligned} 12) \text{ Area of triangle} &= \sqrt{21 \times 8 \times 7 \times 6} = \sqrt{3 \times 7 \times 2 \times 2 \times 2 \times 7 \times 2 \times 3} \\ &= 3 \times 7 \times 2 \times 2 = 84 \text{ sq.cm} \end{aligned}$$

$$\frac{1}{2} \times 14 \times h = 84$$

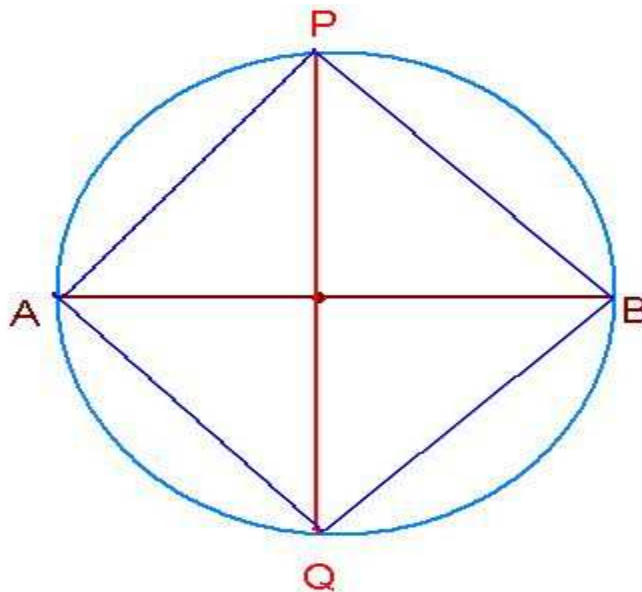
$$7h = 84$$

$$h = 84/7 = 12 \text{ cm}$$

**Length of perpendicular Ravi constructed = 12cm**

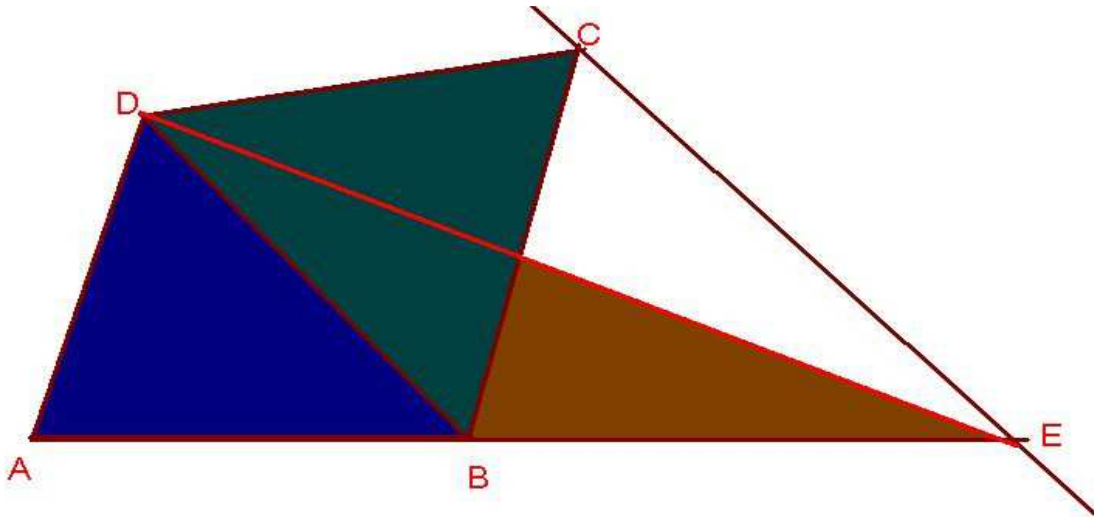
13)

Draw a circle of suitable radius and draw a diameter AB. Construct the perpendicular bisector of AB. Let the perpendicular bisector meet the circle at P, Q then APBQ is the required square



Ratio of length of diagonal to length of one side =  $\sqrt{2} \approx 1.414$

14)



Area of  $\triangle BDC$  = Area of  $\triangle BDE$  (Triangles with same base and between same parallels are of equal area)

Combined area of  $\triangle BDC$  and  $\triangle ADB$  gives the area of quadrilateral ABCD

Area of  $\triangle ADE$  is equal to the area of quadrilateral ABCD

15)

Let Sainaba's age be 'x' and that of Rema's is 'y'

$$x+y=64\text{-----(1)}$$

$$x-y=12\text{-----(2)}$$

$$(1)+(2) \quad 2x = 76 \text{ then } x= 38$$

$$y= 26$$

Sainaba's age is 38 and Rema's age is 26

16) Draw frequency polygon from the data given in the table

17)

Let the sides of the larger square be 'x' and that of smaller square be 'y'

Then  $4x+4y = 52$  or  $x+y = 13$ ----- (1)

$$x^2-y^2 = 91$$

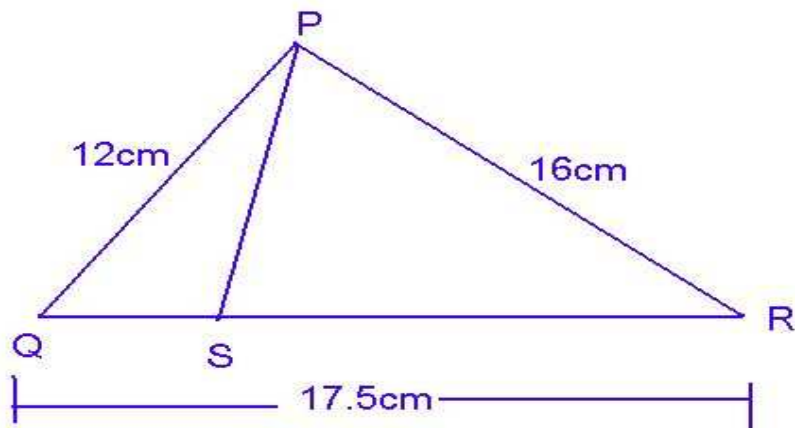
$$(x+y)(x-y) = 91$$

$$13(x-y)=91 \text{ or } x-y = 7 \text{ -----(2)}$$

Solving (1) and (2) we get  $x=10$  and  $y=3$

One side of larger square= 10cm and one side of smaller square is 3cm

18)



a)  $QS:SR = 12:16 = 3:4$

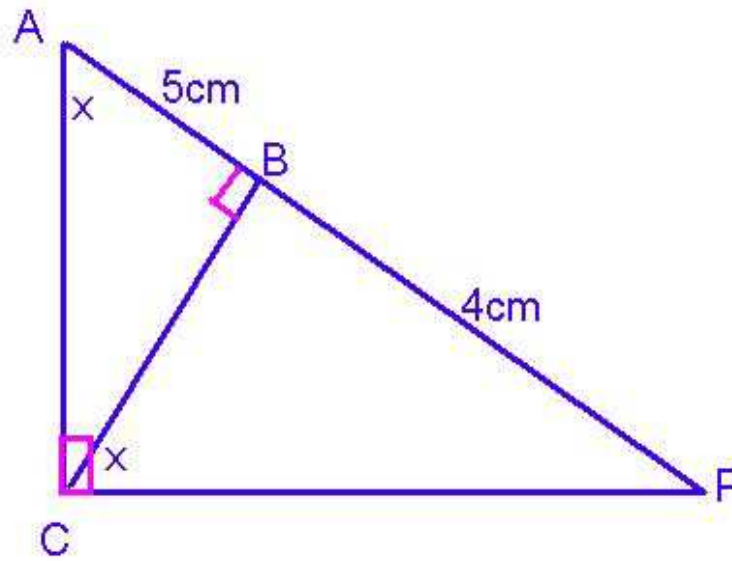
b)  $QS = 17.5 \times \frac{3}{7} = 7.5 \text{ cm}$

$$SR = 17.5 \times \frac{4}{7} = 10 \text{ cm}$$



19) Draw quadrilateral ABCD with the given measurements then construct a triangle whose area is equal to the area of quadrilateral ABCD using the idea of question number 14

20)



The question is incomplete it should be noted be noted that  $\angle ACP = \angle ABC = 90^\circ$

$\angle A = \angle PBC = x$  (given)

Hence  $\triangle APC$  and  $\triangle BPC$  are similar. In similar triangles sides opposite to equal angles are proportionate

$$PA : PC = PC : PB$$

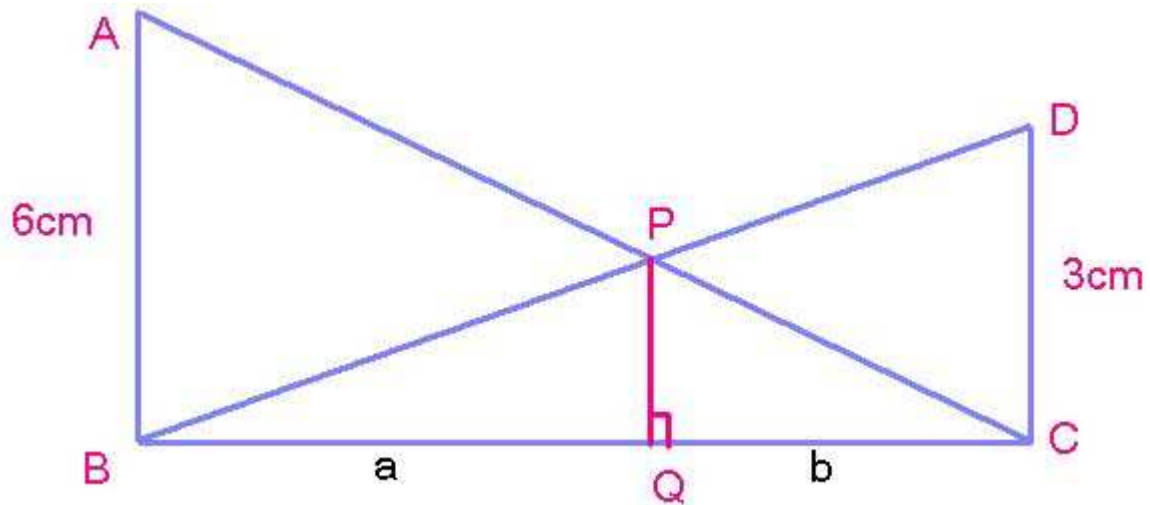
$$\text{Hence } PA \times PB = PC^2$$

$$9 \times 4 = PC^2$$

$$36 = PC^2 \text{ hence } PC = 6\text{cm}$$

21) construct the triangle

22)



Let BQ= 'a' and CQ='b' then BC= a+b

Consider  $\triangle BCD$  and  $\triangle BQP$

$$\angle DCB = \angle BQP = 90^\circ$$

$\angle B = \angle B$  (common angle )

Hence the triangles are similar. Sides opposite to equal angles are proportionate

$$CB : BQ = CD : PQ$$

$$a+b : a = 3 : PQ$$

$$\frac{a+b}{a} = \frac{3}{PQ}$$

$$a = \frac{(a+b)PQ}{3} \text{----- (1)}$$

Consider  $\Delta CBA$  and  $\Delta CQP$

$$\angle CBA = \angle CQP = 90^\circ$$

$$\angle C = \angle C \text{ (Common angle)}$$

Hence the triangles are similar. Sides opposite to equal angles are proportionate

$$CB:CQ = AB:PQ$$

$$a+b : b = 6:PQ$$

$$\frac{a+b}{b} = \frac{6}{PQ}$$

$$b = \frac{(a+b)PQ}{6} \text{-----(2)}$$

(1)+(2)

$$a+b = \frac{(a+b)PQ}{3} + \frac{(a+b)PQ}{6}$$

$$a+b = (a+b)PQ\left(\frac{1}{3} + \frac{1}{6}\right)$$

$$1 = PQ\left(\frac{9}{18}\right)$$

$$PQ = \frac{18}{9} = 2 \text{ cm}$$

23) Prepare a frequency table