# MAR THOMA RESIDENTIAL SCHOOL TIRUVALLA
## SECOND TERMINAL EXAMINATION 2019-20
## MATHEMATICS

**CLASS:9**

MAXMARK:80

TIME:$2\frac{1}{2}$h

### SECTION-A [Attempt all the Questions]

## QUESTION-1

a) Simplify $\left(\frac{a^m}{a^l}\right)^{m+l} \left(\frac{a^l}{a^n}\right)^{l+n} \left(\frac{a^n}{a^m}\right)^{n+m}$ . (3)

b) A point Q(2,-1) is equidistant from the points (p,7) and (-3, p). Find p? (3)

c) Two adjacent sides of a parallelogram are 15cm and 10cm. If the distance between 15cm sides is 8cm; find the distance between 10cm sides. (4)
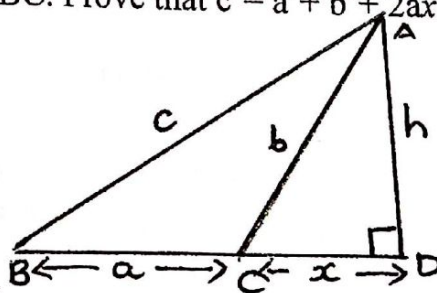
## QUESTION-2

a) Use the information given in following figures to find the values of a,b,c and give reasons also.



(3)
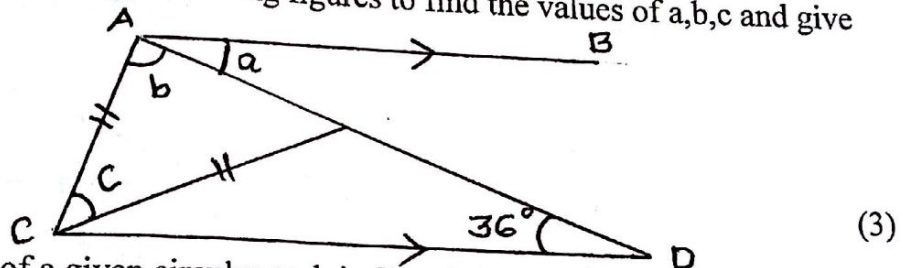
b) The circumference of a given circular park is 55m. It is surrounded by a path width 4.2m . Find the area of the path? (3)

c) Solve for x: $2^{2x+3} - 9 \times 2^x + 1 = 0$. (4)

## QUESTION-3

a) In the figure AD is perpendicular to BC. Prove that $c^2 = a^2 + b^2 + 2ax$. (3)



b) Solve for x : $(36)^{x-3} = 6^3(216)^{3x-4}$. (3)

c) A square plate of side 'x' cm is 8mm thick. If its volume is 2880 cm$^3$ find the value of 'x'? (4)
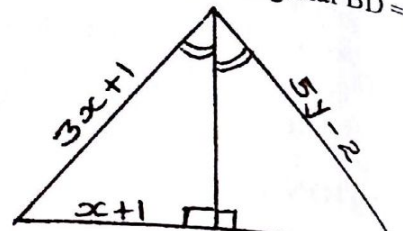
## QUESTION-4

a) Find the area of an isosceles triangle whose equal sides are 5 cm each and base is 6cm? (3)

b) Sketch the graph of 2x+3y = 6. Hence find the area of triangle formed by the line and the axes? (3)

c) In $\triangle ABC$, $< B = 90$. Find the sides of the triangle if $AB = (x-3)$ cm, $BC = (x+4)$ cm and $AC = (x+6)$cm.　　　　　(4)

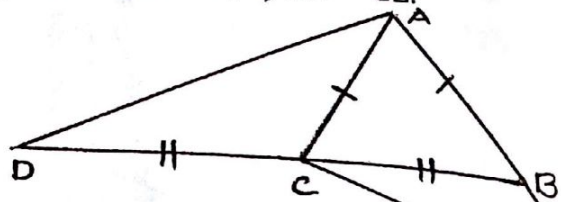## SECTION- B (Answer any four)

### QUESTION-5

a. Construct a parallelogram ABCD in which diagonal AC= 6.8 cm, diagonal BD = 5.6 cm and the angle between the diagonals is $45^0$

b. From the figure find the value of x and y.　　　　　(3)



c. From the following figure prove that i) $<ACD=<CBE$, ii) AD = CE.　　　　(3)

　　　　　(4)



## QUESTION-6

a. If the sides of a triangle are in the ratio $1:\sqrt{2}:1$ . show that it is a right angled triangle?

b. Find the area of a circle whose centre is (5,-3) and which passes through the point (-7,2) [take $\pi = 3.14$]　　　　(3)

c. Use graph paper for the question　　　　(3)
   i) Draw the graphs of 3x-y-2=0 and 2x+y-8 = 0. Take 1cm= 1unit on both the axes and plot three points per line.
   ii) Write down the coordinates of the point of intersection and the area of the triangle formed by the lines and x axis.

## QUESTION-7　　　　(4)

a. The parallel sides of an isosceles trapezium are in the ratio 2:3. If its height is 8cm and area is 240cm2; find its perimeter.

b. Find x if $\log_2(x^2 + 2x) = 3$.　　　　(3)

c. In the figure AB =BC and AD is perpendicular to CD. Prove that $AC^2 = 2BC.DC$　　　　(3)

　　　　(4)
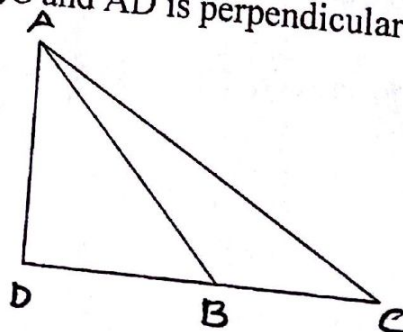
## QUESTION-8

a. Find the point on the y axis which is equidistant from the points A(-4,3) and B(5, 2) .

(3)

b. A cube of a metal of 5cm edge is melted and casted in to a cuboid whose base is 2.50cm× 0.50cm. Find height of the cuboid? Also find surface area of cuboid? (3)

c. Evaluate $\sqrt{\frac{1}{4}} + (0.01)^{\frac{-1}{2}} \times 5 - 27^{\frac{2}{3}}$

(4)

## QUESTION-9

a. The perimeter of a rhombus is 46cm. If the height of the rhombus is 8cm. Find its area?.

(3)

b. Construct a regular hexagon of side 4cm?

(3)

c. A tank 20m long , 12m wide and 8m deep is to be made of iron sheet. It is open at the top. Determine the cost of iron sheet at the rate of ₹ 12.50 per metre if the sheet is 2.5m wide?

(4)

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