GIRLS' HIGH SCHOOL & COLLEGE, PRAYAGRAJ

SESSION:2020-21

CLASS: IX (A,B,C,D,E)

SUBJECT: MATHEMATICS

ASSIGNMENT-01

INSTRUCTIONS:The Parents to ensure that their ward watches the video instructions for this assignment by clicking on the given link:

https://youtu.be/SeyF9bwdX74

She should revise the lesson given in the book and then work on the assignment. The completed assignment is to be downloaded and filed/ pasted in the subject file / copy and kept ready for submission. The day, date and procedure of submission shall be notified later.

Reference Book:- Concise Mathematics Class IX – By R.K. Bansal

TOPIC: PYTHAGORAS THEOREM

Solve the following questions:

Q1.A ladder 13 m long rests against a vertical wall. If the foot of the ladder is 5 m from the foot of the wall, find the distance of the other end of the ladder from the ground.

Q2. A man goes 40 m due north and then 50 m due west. Find his distance from the starting point.

Q3. In a triangle ABC, given below, AB = 8 cm, BC = 6 cm and AC = 3 cm. Calculate the length of OC.
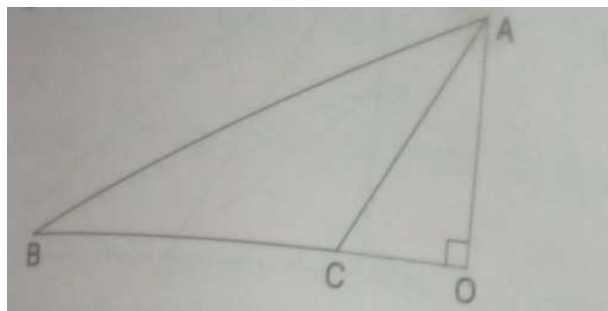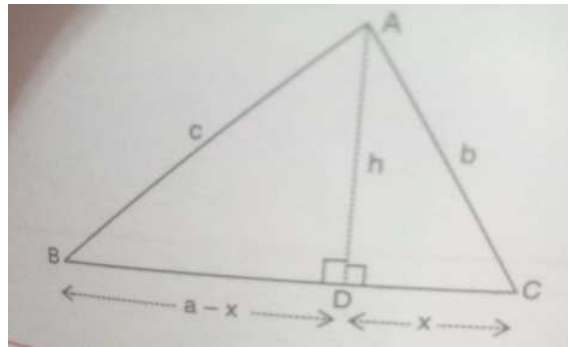

Q4 .Two poles of heights 6 m and 11 m stand vertically on a plane ground. If the distance between their feet is 12 m; find the distance between their tips.

Q5.In a triangle ABC, angle B = 90° Find the sides of the triangle, if:

(i) AB = (x − 3) cm, BC = (x+ 4) cm and AC = (x+ 6) cm.

(ii) AB = x cm , BC = (4x+4) cm and AC = (4x + 5) cm

Q6. In the figure given below, AD is perpendicular to BC.

Prove that: $c^2 = a^2 + b^2 - 2ax$.

Q7. ABC is a triangle, right-angled at B. M is a point on BC. Prove that:

$$AM^2 + BC^2 = AC^2 + BM^2.$$

Q8. In a rectangle ABCD, prove that:

$$AC^2 + BD^2 = AB^2 + BC^2 + CD^2 + DA^2.$$

Q9. Diagonals of a rhombus ABCD intersect each other at point O. Prove that:

$$OA^2 + OC^2 = 2AD^2 - \frac{BD^2}{2}$$

Q10. In an isosceles triangle ABC; AB =AC and D is a point on BC produced. Prove that:

$$AD^2 = AC^2 + BD.CD$$

Q11. In a triangle ABC, AB = AC and BD is perpendicular to AC. Prove that :

$$BD^2 - CD^2 = 2CD \times AD$$

Q12. O is any point inside a rectangle ABCD. Prove that :

$$OB^2 + OD^2 = OC^2 + OA^2$$

Q13. In a quadrilateral ABCD, angle B = 90° and angle D = 90°. Prove that:

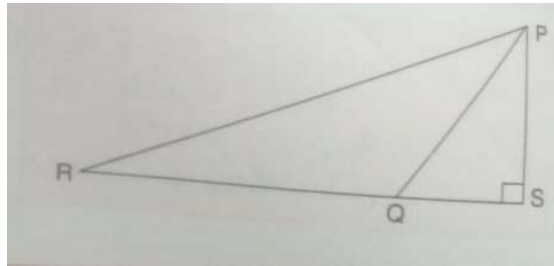$$2AC^2 - AB^2 = BC^2 + CD^2 + DA^2.$$

Q14. In a triangle ABC, angle B = 90° and D is the midpoint of BC. Prove that:

$$AC^2 = AD^2 + 3CD^2$$

Q15. M and N are the midpoints of the sides QR and PQ respectively of a triangle PQR, right-angled at Q. Prove that:

  (i) $PM^2 + RN^2 = 5 MN^2$
  (ii) $4PM^2 = 4 PQ^2 + QR^2$
  (iii) $4RN^2 = PQ^2 + 4 QR^2$
  (iv) $4(PM^2 + RN^2) = 5 PR^2$

Q16. In the figure : angle PSQ = 90° , PQ = 10 cm, QS= 6 cm and RQ= 9 cm . Calculate the length of PR.

Q17. If the sides of a triangle are in the ratio $1:\sqrt{2}: 1$, show that it is a right-angled triangle.

Q18. In equilateral triangle ABC, AD is perpendicular to BC and BC = x cm. Find, in terms of x, the length of AD.

Q19. In the following figure, AD is perpendicular to BC and D divides BC in the ratio 1:3. Prove that:

$$2AC^2 = 2 AB^2 + BC^2$$
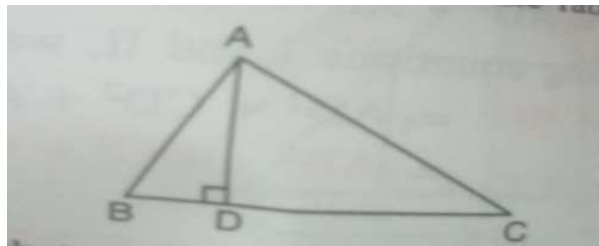
Q20. In a triangle ABC, AB=AC=x; BC=10cm and the area of the triangle is 60cm². Find x.

END