PERL EDUCATION

DPP

DAILY PRACTICE PAPER

SIMILARITY

MATHEMATICS

10TH ICSE

DPP -1

1) Copy triangle PQR and the point C.
    (a) Constuct accurately the image of triangle PQR after an enlargement by a scale factor of 3, using C as the centre of enlargement.

    (b) (i) Measure the lengths P'Q' and PQ and work out——;

    (ii) Measure the lengths P'R' and PR and work out——;

    (iii) Measure the lengths R'Q' and RQ and work out——;

    (c) What do you notice about your answers to part (b)?

2) A square ABCD has its vertices at (5, 5), (5, 7), (7, 7) and (7, 5) respectively. Enlarge this square by using a scale factor of 3 with the point (6, 6) as the centre of enlargement. Write down the coordinates of the vertices of the enlargement A_1, B1, C1, and D_1.

3) Enlarge the triangle OAB so that it fits exactly into the rectangle. State the scale factor of the enlargement.

4) Draw the image of the shape DEFG after an enlargement by a scale factor of – with centre C. Label the image D' E'F'G'.

5) On a map drawn to a scale of 1: 2, 50,000 a triangular plot of land has the following measurements. AB = 3 cm, BC = 4 cm, $\angle$ ABC = 90°. Calculate.
    (a) the actual length of AB in km.
    (b) the area of the plot in sq. km.

6) The map shows four places and the roads that connect them. The scale of the map is 1 : 5000. For each case below find:
    the actual distance between the two places in metres is on the map
    (a) the distance between home and school is 8cm;
    (b) the distance between school and post office is 6 cm;
    (c) the distance between home and post office is 10 cm;
    (d) the distance between home and station is 14cm.

7) A model of a car is constructed using a scale of 1 : 20. If the length of the real car is 6 metres. What is the length of the model ?

8) A model boat has length 25cm, whereas its real counterpart has length 4m (400 cm).To what scale was the model built?

9) Which of the following triangles is 'the one that is different' i.e., not similar to the other two?

(a)   (b)   (c)
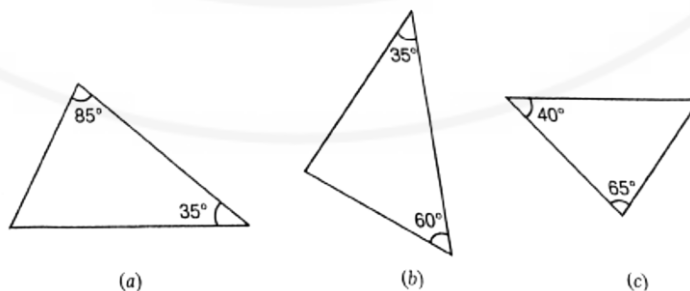
10) ΔABC, is similar to ΔXYZ. Write down the ratio of the corresponding sides and its numerical value.

11) In ΔABC, DE is parallel to BC. If $\dfrac{\quad}{\quad}$ – and AE = 1.2 cm, find EC.

12) In ΔABC, DE ∥ BC. If $\dfrac{\quad}{\quad}$ – and AC = 18 cm, find AE.

13) If D and E are respectively the points on the sides . AB and AC of a ΔABC such that AD = 6cm, BD = 9cm, AE = 8 cm and EC = 12cml; find ∠B if ∠D = 50°.

14) In Fig the angles BAC and ADB are right angles, BA = 5cm, AD= 3, BD=4 cm.
   (a) Prove that triangle ΔADC and ABD are similar.
   (b) Calculate the length of DC.
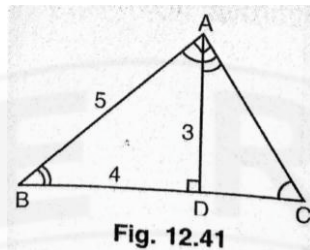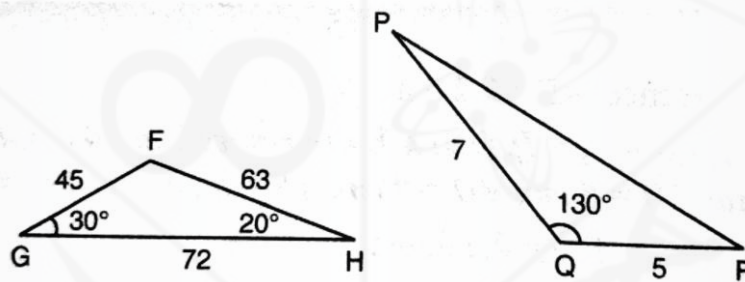

Fig. 12.41

15) In fig prove that triangles FGH and PQR are similar, and find angles P, R and length PR.

16) in the fig, EA and FB are perpendiculars to AB. If AO = 10cm, BO =6 cm and FB = 9cm. Find EA.

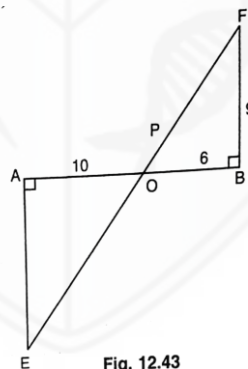
Fig. 12.43

17) A vertical stick 16cm log casts a shadow 7 cm long on the ground. At the same time a tower casts a shadow 35 m long on the ground. Determine the height of the tower.

18) Prove that the straight line joining through the middle point of one side of a triangle parallel to another side bisects the third side.

19) Prove that the straight line joining the middle points of two sides of a triangle is parallel to the third side, and equal to half of it

20) Prove that any line parallel to parallel sides of a trapezium divides the non-parallel sides proportionally.

21) Any point P inside ΔABC is joined to its vertices. From a point D on AP, DE is drawn parallel to AB and EF is drawn parallel to BC. Prove that DF ∥ AC .

22) Prove that the diagonals of a trapezium cut each other in the same ratio.

23) If the diagonals of a quadrilateral divide each other proportionally, prove it is a trapezium.

24) If three or more parallel lines are intersected by two transversals, the intercepts made by them on the transversals are proportional.

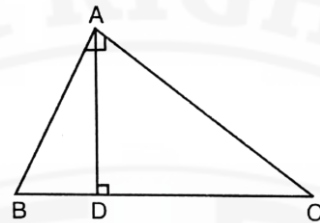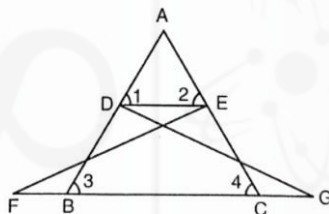25) In fig ∠BAC = 90°, and segment AD⊥BC. Prove that AD^2 = BD x DC.

Fig. 12.65

26) Through the midpoint M of the side CD of a parallelogram ABCD, the line BM is drawn intersecting AC in L and AD produced in E. Prove that EL = 2BL.

27) In fig ΔFEC ≅ ΔGBD and ∠1 = ∠2. Prove that ΔADE ∼ ΔABC.

28) In a ΔABC, P and Q are points on the sides AB and AC respectively, such that PQ ∥ BC. Prove that median AD drawn from A to BC, bisects PQ.

29) If two triangles are equiangular, prove that the ratio of the corresponding sides is same as the ratio of the corresponding medians.

30) The areas of two similar triangles are 360 and 250 square units. If a side of the first triangle is 8 units, how long is the corresponding side of the second triangle?

31) The sides AD, BC of a trapezium ABCD are parallel and the diagonals AC, BD meet at O. The area of the triangle AOB = 3 cm^3, and the area of the triangle BDC = 8 cm^2. Calculate the value of
    (a) the area of triangle BOC;
    (b) the ratio AO : OC ;
    (c) the area of triangle AOD.

32) Two isosceles triangles have equal vertical angles and their areas are in the ratio 16 : 25. Find the ratio of their corresponding heights.

33) In adjoining figure DE∥BC and the ratio of the areas of ΔADE and trapezium BDEC is 4 : 5. Find the ratio of DE : BC.

Fig. 12.91

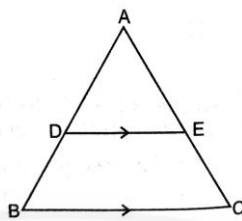34) In fig. ABC is a triangle, DE ∥ BC and — –
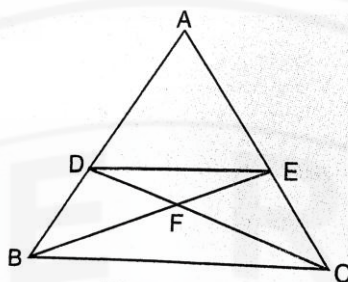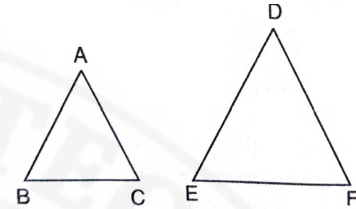

Fig. 12.92

    (a) Write down —

    (b) Prove that the triangle ADE is similar to triangle ABC and write down the ratio —

    (c) Prove that △DEF is similar to △CFB.

    (d) Write down the ratio $\dfrac{\quad\quad}{\quad} \,\triangle DF$

35) ABCD is a trapezium in which AB is parallel to DC, and diagonals AC, BD cut at X. A line is drawn through C parallel to DA to cut DB, produced if necessary at Y. Prove that

    (a) The triangles AXD, BXC are equal in area;

    (b) The triangles AXD, CXY are similar;

    (c) — — .

36) Equilateral triangles described on the two sides of a right angled triangle are together equal to the equilateral triangle on the hypotenuse.

37) Any triangle described on one side of a square as base is one-half of the similar triangle described on the diagonal as base.

38) prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares of the corresponding medians.

39) The scale of a map is cm to 1km. Find the area of an estate represented by 5.4 cm² on the map.

40) On a map, drawn to a scale of 1: 25000, a triangular plot ABC of land has the following measurements. AB = 6cm, BC = 8 cm and ∠ABC = 90°. Calculate

    a) the actual lengths of BC and AC in kilometres;

    b) the actual area of the plot in sq. kilometres.

41) A model of a ship is made to a scale of 1: 200.

    (a) The length of model is 4m. Calculate the length of the ship.

    (b) The area of the deck of the ship is 160000 m². Find the area of the deck of the model.

    (c) The volume of the model is 200 litres. Calculate the volume of the ship in m³.

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MATHEMATICS
10TH ICSE

DPP-2

1. In the given figure, Δ ABC is similar to ΔDEF, AB= (x-0.5) cm, AC= 1.5x cm, DE= 9cm, and DF=3x cm. Find the lengths of AB and DF.

2. In the given figure , AP= 8cm, BP= 22cm, AQ =12 cm and QC = 8cm

   i.   Show that Δ APQ is similar to ΔACB.
    ii.   If PQ = 14 cm, find BC.
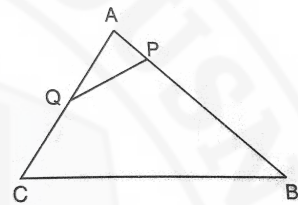
3. A perpendicular drawn from the vertex of the right angle of a right- angled triangle divides the triangle into two triangles similar to each other and also to the original triangle. Prove it.

4. In the given figure, lines *l* and *m* are parallel. Three concurrent lines through point O meet line l at points A, B and C; and line m at points p. Q and R as shown
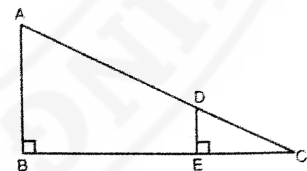
    Prove that: $\frac{AB}{BC} = \frac{QR}{PQ}$.
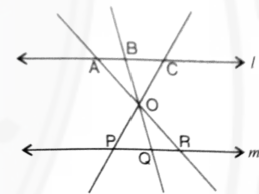
5. In the figure , given alongside, ∠QPS =∠RPT and ∠PRQ =∠PTS.
    i.   Prove that triangles PQR and PST are similar.
    ii.   If PT : ST = 3:4; find the ratio between QR : PR
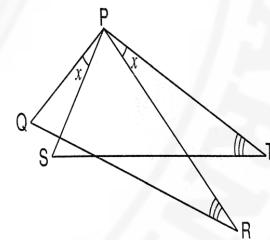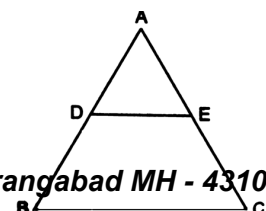
6. In the given figure, AB and DE are perpendiculars to BC. If AB = 9 cm, DE=3 cm and AC= 24 cm, calculate AD.

7. In the adjoining figure, ABC is a triangle right –angled at vertex A and AD is altitude.
    i.   Prove that : ΔABD is similar to ΔCAD.
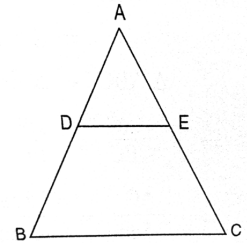   ii.   If BD = 3.6 cm and CD = 6.4 cm ; find the length of AD.
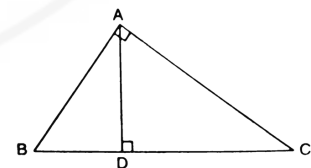
8. In the adjoining figure; DE//BC and D divides AB in the ratio 2 : 3. Find

    i. $\frac{AE}{EC}$
    ii. $\frac{AE}{AC}$
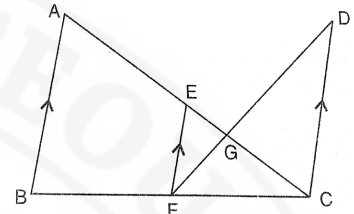   iii. DE if BC = 7.5cm

9. In Δ ABC , D and E are points on the sides AB and AC respectively. Find whether DE//BC; if :

    i.   AD = 3 cm,   BD = 4.5 cm,

         AE = 4cm   and   AC= 10 cm

    ii.   AB = 7cm,   BD= 4.5 cm,

         AE = 3.5 cm   and   CE= 5.6cm

10. In the given figure; AB//EF//CD. Given that AB= 7.5 cm,
EG =2.5, GC = 5 cm and DC =9cm.

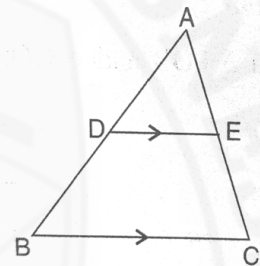   Calculate : i) EF   ii) AC.
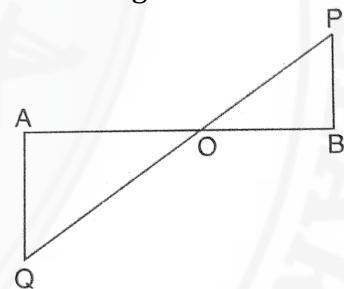

11. In the given figure, DE//BC.
    i.   Prove that Δ ADE and Δ ABC are similar.
    ii.   Given that AD = $\frac{1}{2}$ BD, calculate DE if BC = 4.5 cm.

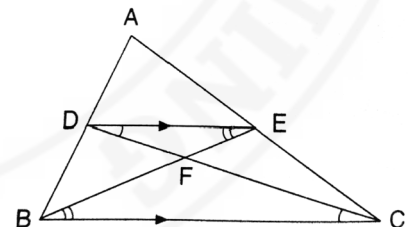   Also , fine $\frac{Ar.(\Delta ADE)}{Ar.(\Delta ABC)}$ and $\frac{Ar.(\Delta ADE)}{Ar.(trapezoium\ BCED)}$

12. In the figure, given alongside, PB and QA are perpendiculars to the line segment AB. If PO= 6 cm, QC = 9 cm and area of ΔQOA.
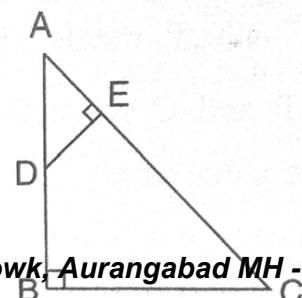

13. In the given figure, DE is parallel to the base BC of triangle ABC and AD: DB = 5 : 3. Find the ratio:

    i. $\frac{AD}{AB}$ and then $\frac{DE}{BC}$
    ii. $\frac{Area\ of \Delta DEF}{Area\ of \Delta DEC}$.

14. In the ΔABC, ∠B =90°, AB = 12 cm and AC = 15cm. D and E are points on AB and AC respectively such that ∠ADE =90° and DE = 3 cm. Calculate the area of Δ ABC and then the area of ΔADE.

15. A model of a ship is made to a scale of 1: 200. If the length of the model is 4m; calculate the length of the ship.

16. The scale of map is 1 : 50,000. In the map, a triangular plot ABC if land has the following dimensions: AB = 2cm, VC = 3.5 cm and angle ABC = 90°

   Calculate:

   i.   the actual length of side BC, in km, of the land.
   ii. The area of the plot in sq. km.

17. A rectangular tank has length = 4m, width = 3 m and capacity = 30m³. A small model of the tank is made with capacity 240 cm³. Find :
   i.   The diamensions of the model.
   ii. The ratio between the total surface area of the tank and its model.