Class-10

Mathematics part-2

Question bank

1.Similarity

Q.1 A) MCQ (1 Mark)

1.If $\Delta ABC \sim \Delta PQR$ and $AB:PQ = 3:4$ then $A(\Delta ABC):A(\Delta PQR) =?$

(A)9:25   (B) 9:16   (C) 16:9   (D)25:9

2.Which of the following is not a test of similarity?

(A)AAA   (B)SAS   (C) SAA   (D)SSS

3.If $\Delta XYZ \sim \Delta PQR$ and $A(\Delta XYZ) = 25\ cm^2$, $A(\Delta PQR) = 4\ cm^2$ then $XY:PQ =?$

(A) 4:25   (B)2:5   (C) 5:2   (D)25:4

4.Ratio of areas of two similar tringles is 9:25. _____ is the ratio of their corresponding sides.
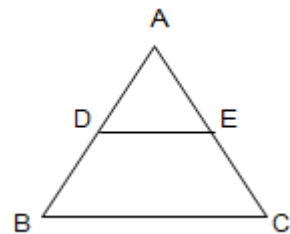
(A)3:4   (B)3 :5   (C) 5:3   (D)25:81

5. *Given* $\Delta ABC \sim \Delta DEF$, if $\angle A = 45°$ and $\angle E = 35°$ then $\angle B =?$

(A) 45°   (B)35°   (C)25°   (D) 40°

6. In fig,seg DE‖ seg BC, identify correct statement.

(A)$\dfrac{AD}{DB} = \dfrac{AE}{AC}$ (B)$\dfrac{AD}{DB} = \dfrac{AB}{AC}$

(C) $\dfrac{AD}{DB} = \dfrac{EC}{AC}$ (D) $\dfrac{AD}{DB} = \dfrac{AE}{EC}$

7.If $\Delta XYZ \sim \Delta PQR$ then $\dfrac{XY}{PQ} = \dfrac{YZ}{QR} =?$

(A) $\frac{XZ}{PR}$ (B)$\frac{XZ}{PQ}$ (C) $\frac{XZ}{QR}$ (D) $\frac{YZ}{PQ}$

8. If ΔABC~ ΔLMN and ∠A = 60° then ∠L =?

(A) 45°   (B)60°   (C)25°   (D) 40°

9. In ΔDEF and ΔXYZ , $\frac{DE}{XY} = \frac{FE}{YZ}$ & ∠E ≅ ∠Y _____ test gives similarity between ΔDEF & ΔXYZ.

(A)AAA   (B)SAS

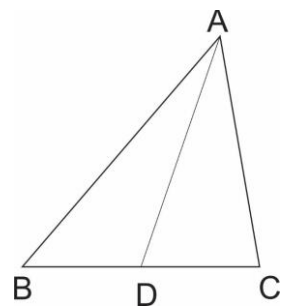(C) SAA   (D)SSS
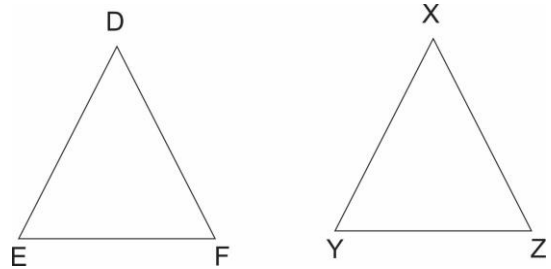
10. In fig BD=8, BC=12   B-D-C then $\frac{A(\Delta ABC)}{A(\Delta ABD)} =?$
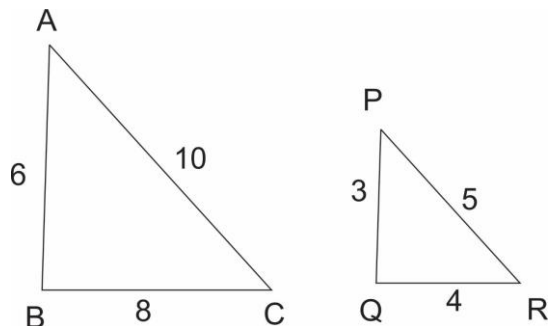
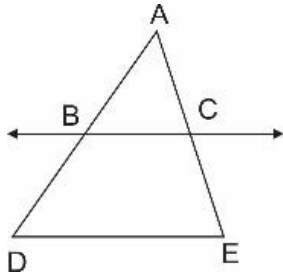(A)2:3   (B)3:2

(C) 5:3   (D)3:4

Q.1 B)   **Solve**   **1 mark**

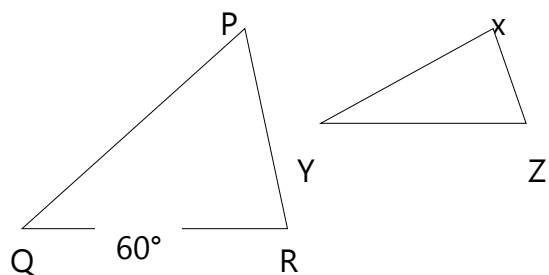B.1 Are triangles in figure similar ? If yes then write the test of similarity.

2. In fig line BC|| line DE, AB=2 ,BD=3 ,AC=4 and CE= x , then find the value of x.

3.State whether the following triangles are similar or not : If yes , then write the test of similarity.

∠P = 35° ,   ∠x = 35° and ∠Q = 60°, ∠Y =
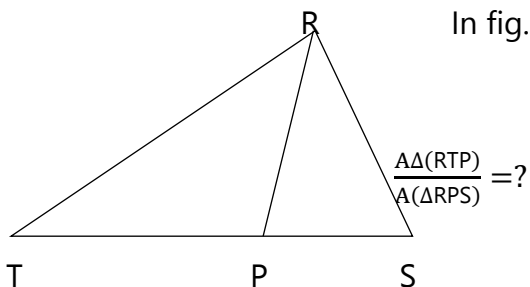
4. If ΔABC∼ ΔLMN & ∠B = 40° then ∠M =? Give reason .

5.Areas of two simlar triangles are in the ratio 144:49. Find the ratio of their corresponding sides.

6. ΔPQR∼ ΔSUV write pair of congruent angle.

7. ΔABC∼ ΔDEF   write ratio of their corresponding sides.

8.   In fig. TP =10 cm PS=6 cm

$\frac{A\Delta(RTP)}{A(\Delta RPS)}$ =?
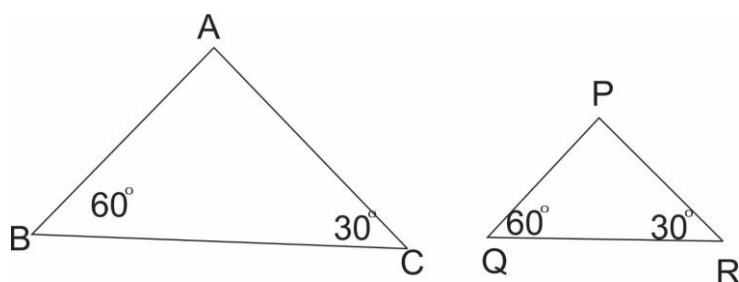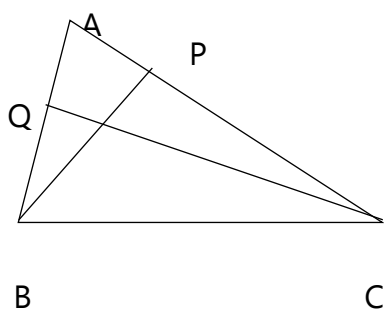
9.Ratio of corresponding sides of two similar triangles is 4:7 then find the ratio of their areas = ?

10. Write the test of similarity for triangles given in figure.

Q.2 A.Complete the activity 2marks

1.

in fig. BP $\perp$ AC,CQ $\perp$ AB A-P-C

& A-Q-B then   show that

ΔAPB & ΔAQC are similar

In   ΔAPB & ΔAQC   ∠APB = [   ]^0 ... (I)

∠AQC = [   ]^0 ... (II)

∠APB ≅ ∠AQC   (I) & (II)

∠PAB ≅ ∠QAC [...........]

ΔAPB∼ ΔAQC [..........]

2.Observe the figure & complete following activity.

in fig∠B $= 75^0$, ∠D $= 75^0$

∠B ≅ [....]   each of 75^0

∠C ≅ ∠C   [....]

ΔABC∼ Δ[........]
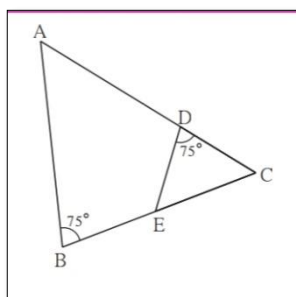
....[.....]similarity test

3.   ΔABC∼ ΔPQR , A(ΔABC)= 80sqcm   A(ΔPQR) = 125 sqcm   then complete

$$\frac{A(\Delta ABC)}{A(\Delta PQR)} = \frac{80}{125} = \frac{[....]}{[....]} \text{ hence } \frac{AB}{PQ} = \frac{[.....]}{[.....]}$$

4.in fig.PM=10 cm   A(ΔPQS)= 100sqcm A(ΔQRS) = 110sqcm then NR?
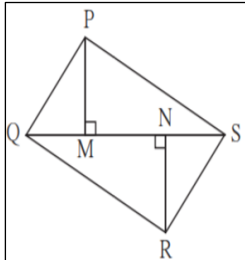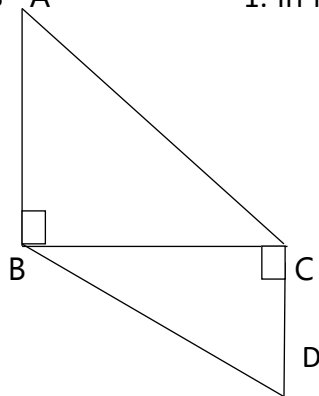

ΔPQS &ΔQRS having seg QS common base

Areas of two triangles whose base are common, are in proportion of their corresponding [.......]

$$\frac{A(\Delta PQS)}{A(\Delta QRS)} = \frac{[....]}{NR} \quad , \quad \frac{100}{110} = \frac{[....]}{NR} \quad , NR = [.....] \text{ cm}$$
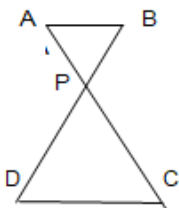
Q.2 B A   1. In figAB $\perp$ BC and DC $\perp$ BC AB=6, DC=4

$$then \; \frac{A(\Delta ABC)}{A(\Delta BCD)} =?$$

2.   In fig seg AC & seg BD intersect each other at point p

$\frac{AP}{PC} = \frac{BP}{PD}$ then prove that ΔABP~ ΔDPC

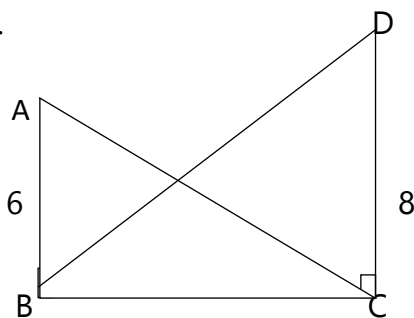3. ΔABP~ ΔDEF   & A(ΔABP): A(ΔDEF) = 144: 81 then AB: DE =?

4. From given information is PQ|| BC ?
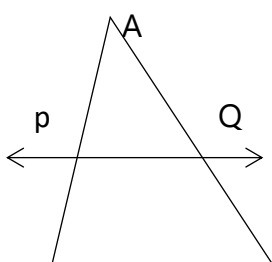
AP=2, PB=4 AQ=3,QC=6

B   C

5. Areas of two similar triangles are 225 cm^2 and ,81 cm^2 if side of smaller triangle is 12cm. find corresponding side of major triangle

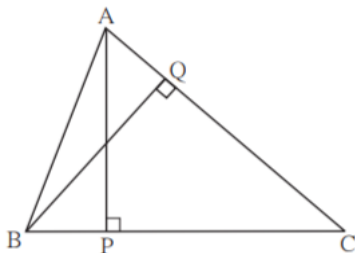6.   D   from adjoining figure

A $\angle ABC = 90°$ $\angle DCB = 90°$ $AB = 6$,

6   8   DC=8 then $\frac{A(\triangle ABC)}{A(\triangle BCD)} = ?$

B   C

Q.3A) Complete the following activity 3 marks

.

1. $\triangle ABC$ APpendicular BC & BQ perpendicular AC , B-P-C,A-Q-C
then   show that $\triangle CPA \sim \triangle CQB$ if AP=7,BQ=8 BC=12
then AC=? $In \triangle CPA$ and $\triangle CQB$ $\angle CPA \cong [\angle ...]$.(each 90^0)

    $\angle ACP \cong [\angle ...]$.(common angle)

    $\triangle CPA \sim \triangle CQB$ (..........similarity test)

    $\frac{AP}{BQ} = \frac{[....]}{BC}$ (corresponding sides of similar triangle)
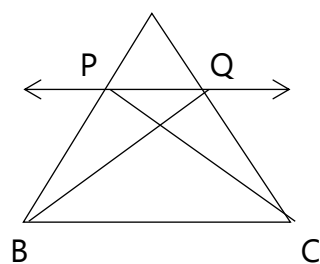
    $\frac{7}{8} = \frac{[....]}{12}$

    ACx[.....]=7x12 AC=10.5

2. A line is parallel to one side ot triangle which intersects remaining two sides in two distinct point then that line divdes sides in same proportion.

Given :In ΔABC line l II side BC & line l intersect side AB in P & side AC in Q   A

P   Q

B   C

Given: $\dfrac{AP}{PB} = \dfrac{AQ}{QC}$ construction :draw CP & BQ

Proof : ΔAPQ&ΔPQB   have equal height

$\dfrac{A(\Delta APQ)}{A(\Delta PQB)} = \dfrac{[....]}{PB}$ (areas in proportion of base)I

$\dfrac{A(\Delta APQ)}{A(\Delta PQC)} = \dfrac{[....]}{QC}$ (areas in proportion of baseII

ΔPQC&ΔPQB have [.....]is common base SegPQ II Seg BC hence height of: ΔAPQ&ΔPQB

$A(\Delta PQC)$=A(Δ......)...........(III)

$\dfrac{A(\Delta APQ)}{A(\Delta PQB)} = \dfrac{A(\Delta ....)}{A(\Delta ....)}$ ....[(I),(II)&(III)]

$\dfrac{AP}{PB} = \dfrac{AQ}{QC}$ ....[(I) & (II)]

From fig.seg PQ II side BC

AP= x +3 ,PB=x -3,AQ= x +5 ,QC=x-2

then complete the activity to find the value of x

 inΔPQB, PQ II side BC

$\dfrac{AP}{PB} = \dfrac{AQ}{[...]}$ ....([...........])

$$\dfrac{x+3}{x-3} = \dfrac{x+5}{[...]}$$

(x+3)[......]=(x+5)(x-3)

x^2+x-[....]=x^2+2x-15

x=[....]

3.   A

x+3   x+5

P   Q
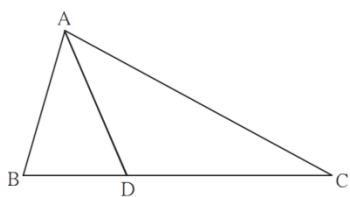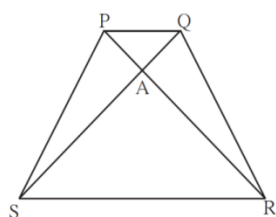
x-3   x-2

B   C
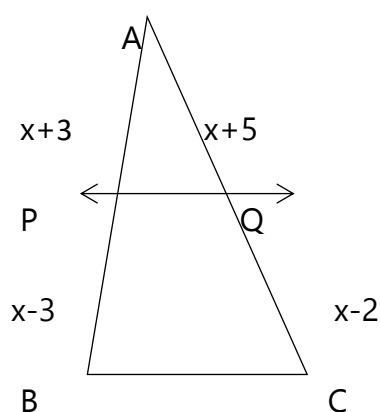
Q.3 B 3 marks
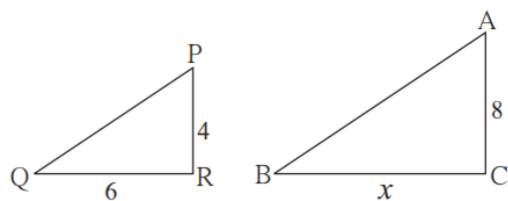
1. There are two poles having heights 8m & 4m on plane ground as shown in fig. Because of sunlight shadow of smaller pole is 6m long then find the length of shadow of longer pole.

2. In △ABC B-D-C & BD=7, BC=20 then find the following ratio
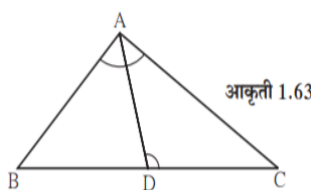

1) $\dfrac{A(\triangle ABD)}{A(\triangle ADC)}$

2) $\dfrac{A(\triangle ABD)}{A(\triangle ABC)}$
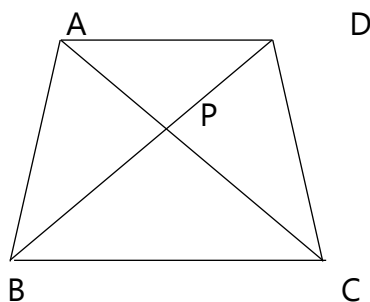
3) $\dfrac{A(\triangle ADC)}{A(\triangle ABC)}$

3. In given fig.quadrilateral PQRS side PQ ||side SR ,AR=5 AP, then prove that , SR=5PQ

4.

आकृती 1.63

In triangle ABC point D is on side BC (B-D-C) such that ∠BAC = ∠ADC then prove that $CA^2 = CB \times CD$

5.

In Quadrlateral ABCD Side AD II BC diagonal AC & BD intersct in point P then prove that $\dfrac{AP}{PD} = \dfrac{PC}{BP}$

Q.4 4 marks

1. Side of eqilateral triangle PQR is 8 cm then find the area of triangle whose side is half of side of triangle PQR

2. Areas of two similar triangle are equal then prove that triangles are congruent

3. Two triangles are similar .Smaller triangle sides are 4 cm ,5 cm,6 cm perimter of larger triangle is 90 cm then find the sides of larger triangle.

Q.5 3 marks

1. In fig , PS = 2, SQ=6 QR = 5, PT = x & TR = y. then find the pair of value of x&y such that ST ll side QR.
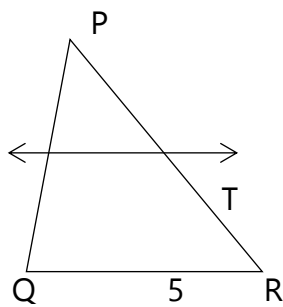
2 .An architecture have model of building, length of building is 1m then length of model is 0.75cm then find length & height of model building whose actual length is 22.5m& heght is 10m.