

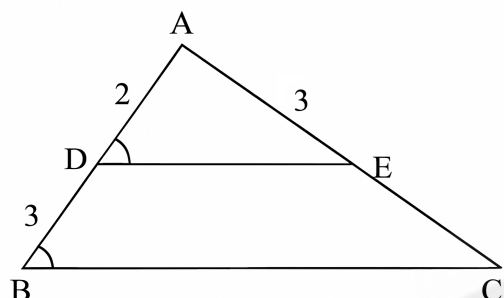
UDAAN 2026

MATHS

Triangles

DHA : 05

Q1 If $\angle ADE = \angle ABC$, then $CE =$



- (A) 2 (B) 5
(C) $9/2$ (D) 3

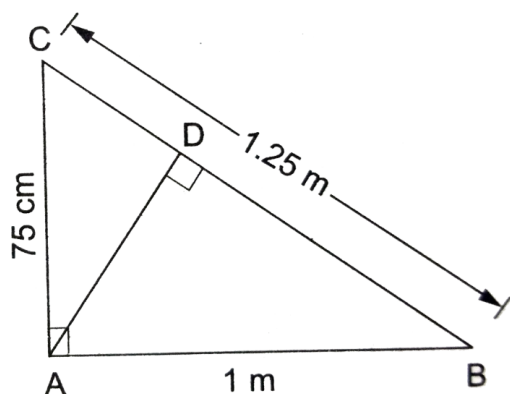
Q2 In the given figure, $DB \perp BC$, $DE \perp AB$ and $AC \perp BC$.

Check that $\frac{BE}{DE} = \frac{AC}{BC}$.



- (A) Yes
(B) No
(C) Can not determined

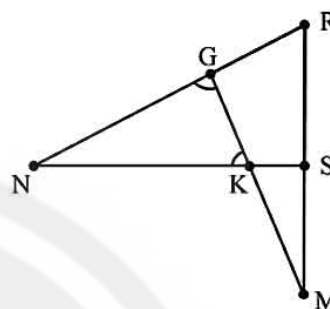
Q3 In the given figure, $\angle CAB = 90^\circ$ and $AD \perp BC$. If $AC = 75$ cm, $AB = 1$ m and $BC = 1.25$ m, find AD .



- (A) 60cm (B) 65cm
(C) 55cm (D) 70cm

Q4 In the adjoining figure, $\angle NKG = \angle NGK$ and K divides NS in the ratio 74:37. Find

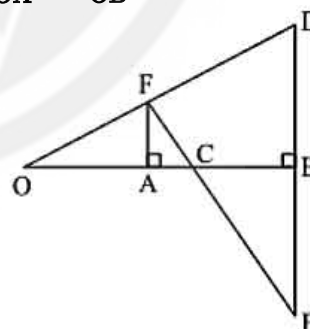
$$\frac{RM}{2RG} = \text{-----?}$$



- (A) $\frac{SM}{NK}$ (B) $\frac{SM}{2NK}$
(C) $\frac{SM}{CG}$ (D) None of these

Q5 In the adjoining figure, OB is perpendicular bisector of the line segment DE. $FA \perp OB$ and FE intersects OB at the point C. Find

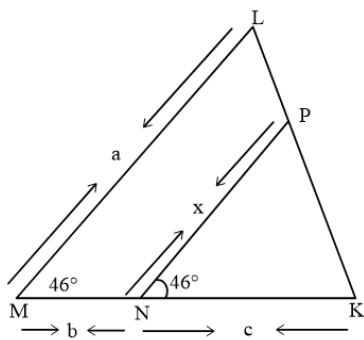
$$\frac{1}{OA} + \frac{1}{OB} = \text{-----?}$$



- (A) $\frac{1}{OC}$ (B) $\frac{2}{OC}$
(C) $\frac{3}{OC}$ (D) $\frac{4}{OC}$

Q6 In Fig. $\angle LMK = \angle PNK = 46^\circ$. Express x in terms of a, b and c where a, b, c are lengths of LM, MN and NK.

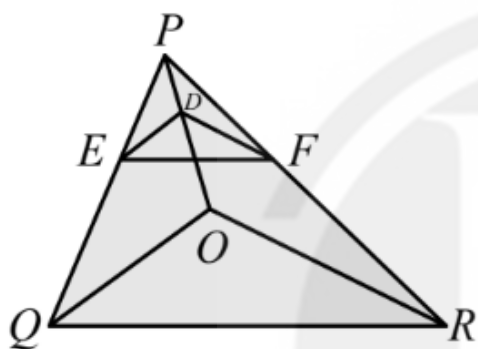




- (A) $\frac{ac}{b-c}$ (B) $\frac{ac}{b+c}$
 (C) Both A and B (D) None of these

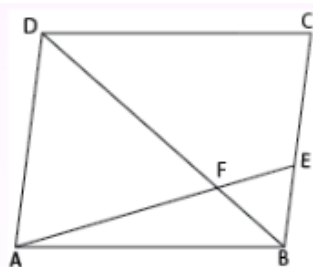
Q7 In the figure given along side, $DE \parallel OQ$ and $DF \parallel OR$.

Check that $EF \parallel QR$.



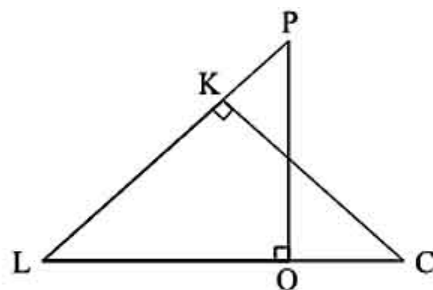
- (A) Yes (B) No

Q8 ABCD is a parallelogram and E is a point on BC. If the diagonal intersects AE at F, then which statement is true.



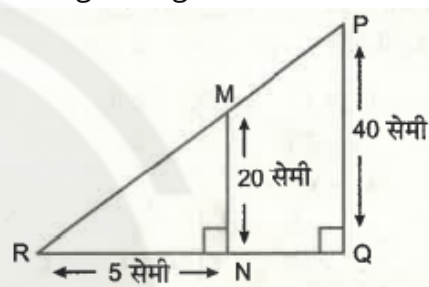
- (A) $DF \times FB = EF \times FA$.
 (B) $AF \times EF = FB \times FD$.
 (C) $AF \times FB = EF \times FD$.
 (D) None of these

Q9 In the given figure, $\triangle LOP$ and $\triangle LKC$ are two right triangles, right angled at O and K respectively. Find $(LO)^2 \times (LC)^2 = \underline{\hspace{2cm}}$?



- (A) $\frac{(OP)^2}{(KC)^2}$
 (B) $\left(\frac{LP}{LC}\right)^2$
 (C) $(LP)^2 \times (LK)^2$
 (D) $(OP)^2 \times (LP)^2$

Q10 In the given figure the value of NQ will be:



- (A) 5 cm (B) 10 cm
 (C) 20 cm (D) 40 cm



Answer Key

Q1 C
Q2 A
Q3 A
Q4 A
Q5 B

Q6 B
Q7 A
Q8 C
Q9 C
Q10 A



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Hints & Solutions

Q1 Text Solution:

Given that $\angle ADE = \angle ABC$ and $\angle A$ is common to both triangles $\triangle ADE$ and $\triangle ABC$, we can conclude that $\triangle ADE \sim \triangle ABC$ by the angle - Angle (AA) criterion.
Set up the proportion of corresponding sides.
Since the triangles are similar, the ratio of their corresponding sides is equal.
we have $AD/AB = AE/AC$. From the figure, $AD = 2$ and $DB = 3$, so
 $AB = AD + DB = 2 + 3 = 5$. Also, $AE = 3$, Let $CE = x$, so
 $AC = AE + CE = 3 + x$.
Substituting these values into the proportion:
 $2/5 = 3/(3 + x)$
 $2x = 15 - 6$
 $2x = 9$
 $x = 9/2$

Video Solution:



Q2 Text Solution:

In $\triangle BED$ and $\triangle ACB$, we have:

$$\angle BED = \angle ACB = 90^\circ$$

$$\angle B + \angle C = 180^\circ$$

$$\angle BDE = \angle ACB$$

$$\angle EBD = \angle CAB \text{ (Alternate angles)}$$

Therefore, by AA similarity theorem, we get:

$$\triangle BED \sim \triangle ACB$$

$$BE/AC = DE/BC$$

$$BE/DE = AC/BC$$

This completes the proof.

Video Solution:



Q3 Text Solution:

Given: $\angle CAB = 90^\circ$ and $AD \perp BC$
 $AC = 75$ cm, $AB = 100$ cm or 100 cm,
 $BC = 125$ cm or 125 cm

In $\triangle BDA$ and $\triangle BAC$,

$$\angle BDA = \angle BAC = 90^\circ$$

$$\angle DBA = \angle ABC \text{ (Common angle)}$$

$$\triangle BDA \sim \triangle BAC \text{ (By AA similarity criterion)}$$

$AB/BC = BD/AB = AD/AC$ (Corresponding sides of similar triangles are in same ratio)

Consider, $AB/BC = AD/AC$

$$100/125 = AD/75$$

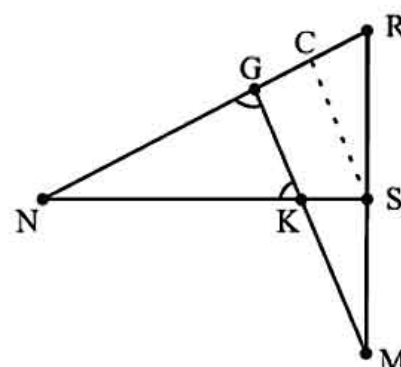
$$AD = 100 \times 75 / 125$$

$$AD = 60 \text{ cm}$$

Video Solution:



Q4 Text Solution:



Draw: $CS \parallel GM$.

In $\triangle GKN$,



NK = NG (side opposite to equal angles are equal)

In $\triangle NSC$, $CS \parallel GK$

$$\frac{NG}{GC} = \frac{NK}{KS} \text{ (by B.P.T.)}$$

$$\frac{NG}{GC} = \frac{74}{37}$$

$$\frac{NG}{GC} = \frac{2}{1}$$

$$NG = 2GC$$

$$GC = \frac{1}{2}NK$$

In $\triangle RGM$, $CS \parallel GM$

$$\frac{CG}{RG}$$

$$= \frac{SM}{RM} \quad \text{(by corollary to B.P.T.)}$$

$$CG \times RM = RG \times SM$$

$$\frac{1}{2}NK \times RM = RG \times SM$$

$$\frac{RM}{2RG} = \frac{SM}{NK}$$

Video Solution:



Q5 Text Solution:

As OB is perpendicular bisector of segment DE, BE = DB.

In $\triangle OAF$ and $\triangle OBD$,

$$\angle AOF = \angle BOD \text{ (common)}$$

$$\angle OAF = \angle OBD \text{ (each } 90^\circ)$$

$$\triangle OAF \sim \triangle OBD$$

$$\frac{OA}{OB} = \frac{FA}{DB} \quad \text{(by C.P.S.T.)} \quad \dots$$

$$\dots \text{eqn. (i)}$$

$$\therefore \triangle FAC \sim \triangle EBC$$

(we proved using AA similarity)

$$\Rightarrow \frac{FA}{EB} = \frac{AC}{BC} \quad \text{(by C.P.S.T.)}$$

$$\Rightarrow \frac{FA}{DB} = \frac{AC}{BC} \quad \dots$$

$$\dots \text{eqn. (ii)}$$

From (i) and (ii), we get.

$$\frac{OA}{OB} = \frac{AC}{BC} \Rightarrow \frac{OA}{OB} = \frac{OC - OA}{OB - OC}$$

$$\Rightarrow OC \times OB - OA \times OB = OA \times OB - OC \times OA$$

$$\Rightarrow OC \times OB + OC \times OA$$

$$= 2(OA \times OB)$$

$$\Rightarrow \frac{1}{OA} + \frac{1}{OB} = \frac{2}{OC}$$

Video Solution:



Q6 Text Solution:

In $\triangle LMK$ and $\triangle PNK$

$$\angle LMK = \angle PNK = 46^\circ$$

$$\angle K = \angle K \text{ (common)}$$

By AA, $\triangle LMK \sim \triangle PNK$

$$\frac{LM}{PN} = \frac{MK}{NK} = \frac{LK}{PK}$$

$$\Rightarrow \frac{a}{x} = \frac{b+c}{c}$$

$$\Rightarrow x = \frac{ac}{b+c}$$



Video Solution:**Q7 Text Solution:**

In $\triangle POQ$

$DE \parallel OQ$ (given)

$$PE/EQ = PD/DO \dots\dots\dots (1)$$

In $\triangle POR$

$DF \parallel OR$ (given)

$$PF/FR = PD/DO \dots\dots\dots (2)$$

From equation (1) and (2)

$$PE/EQ = PF/FR = PD/DO$$

$$PE/EQ = PF/FR$$

In $\triangle PQR$

$$PE/EQ = PF/FR$$

$QR \parallel EF$ (Converse of Basic Proportionality theorem)

Video Solution:**Q8 Text Solution:**

Consider triangles AFD and EBF ,

ADB and CBD are alternate angles.

So, $\angle ADF = \angle EBF \dots\dots\dots (1)$

and $\angle DFA = \angle BFE$ [Vertically opposite angles]

By A.A. Similarity criterion,

$\triangle AFD \sim \triangle EBF$

Since, in two similar triangles, corresponding sides are in the same ratio.

$$AF/EF = FD/FB$$

$$AF \times FB = EF \times FD$$

Video Solution:**Q9 Text Solution:**

In $\triangle LOP$ and $\triangle LKC$

$$\angle LOP = \angle LKC \quad (\text{each } 90^\circ)$$

$$\angle PLO = \angle KLC \quad (\text{common})$$

By AA similarity criterion

$$\triangle LOP \sim \triangle LKC$$

$$\frac{LO}{LK} = \frac{OP}{KC} = \frac{LP}{LC} \quad (\text{by C.P.S.T})$$

$$\frac{LO}{LK} = \frac{LP}{LC}$$

$$\frac{LO}{LP} = \frac{LK}{LC}$$

$$(LO)^2 \times (LC)^2 = (LP)^2 \times (LK)^2$$

Video Solution:**Q10 Text Solution:**

As per the figure,

$\angle MNR = \angle PQR = 90^\circ$ hence $\triangle PQR$ and $\triangle MNR$ are similar triangles.

$$\therefore \frac{MN}{PQ} = \frac{RN}{RQ} \Rightarrow \frac{20}{40} = \frac{5}{RQ} \Rightarrow RQ = 10 \text{ cm}$$

$$\therefore NQ = RQ - RN = 10 - 5 = 5 \text{ cm}$$

Hence option (a) is correct.

Video Solution: