Foundation

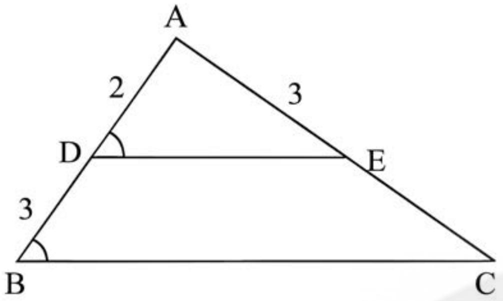
UDAAN 2026

MATHS

Triangles

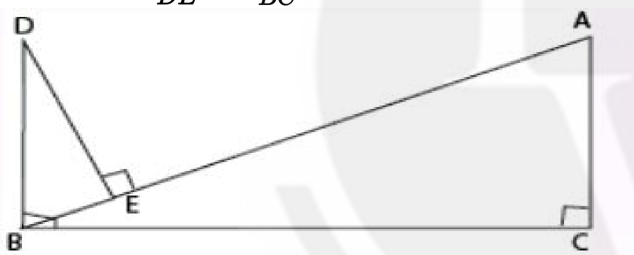
DHA: 06

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



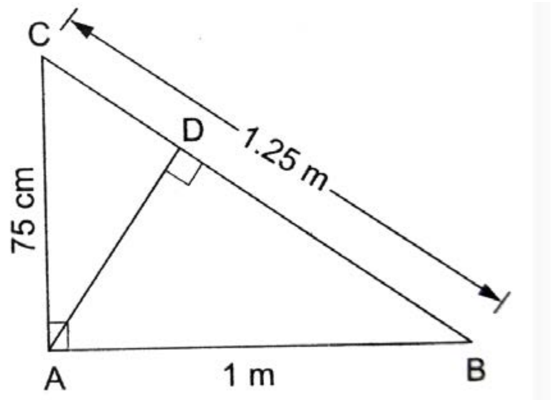
(A) 2 (B) 5
(C) 9/2 (D) 3

Q2 In the given figure, DB BC, DE AB and AC BC. Check that $\frac{BE}{DE} = \frac{AC}{BC}$.



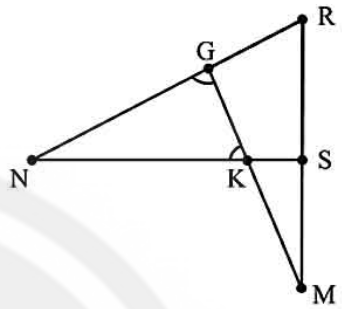
(A) Yes
(B) No
(C) Can not determined

Q3 In the given figure, CAB=90 and AD BC. If AC = 75 cm, AB = 1 m and BC = 1.25 m, find AD.



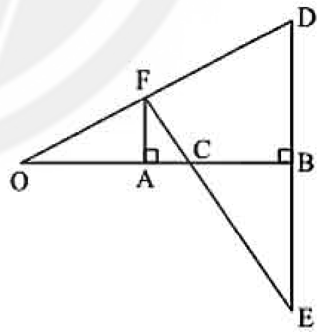
(A) 60cm (B) 65cm
(C) 55cm (D) 70cm

Q4 In the adjoining figure, $\angle NKG = \angle NGK$ and K divides NS in the ratio 74:37. Find $\frac{RM}{2\,RG} =$ _____?



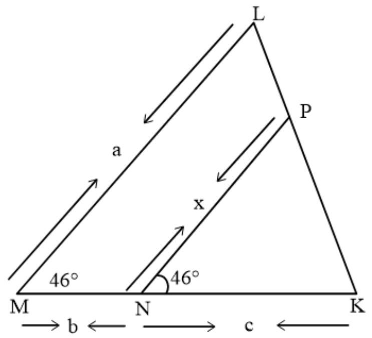
(A) $\frac{SM}{NK}$ (B) $\frac{SM}{2\,NK}$
(C) $\frac{SM}{CG}$ (D) None of these

Q5 In the adjoining figure, OB is perpendicular bisector of thel line segment DE. FA⊥OB and FE intersects OB at the point C. Find $\frac{1}{OA} + \frac{1}{OB} =$ ______?



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

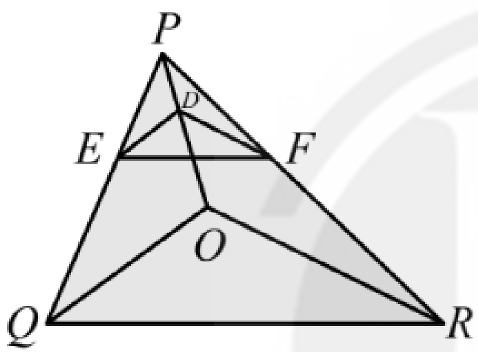
Q6 In Fig. $\angle LMK = \angle PNK$ = 46°. Express x in terms of a, b and c where a, b, c are lengths of LM, MN and NK.



(A) $\frac{ac}{b-c}$ (B) $\frac{ac}{b+c}$

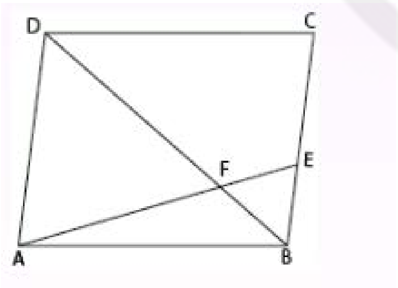
(C) Both A and B (D) None of these

Q7 In the figure given along side, $DE \| OQ$ and $DF \| OR$.
Check that $EF \| QR$.



(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.



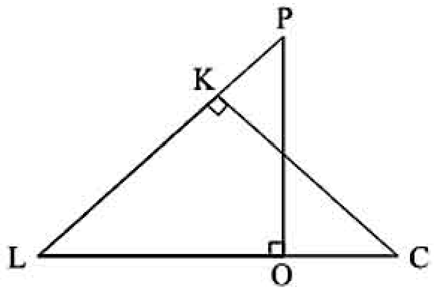
(A) DF×FB=EF×FA.

(B) AF×EF=FB×FD.

(C) AF×FB=EF×FD.

(D) None of these

Q9 In the given figure, LOP and LKC are two right triangles, right angled at O and K respectvely. Find $(LO)^2 \times (LC)^2$ = ________?



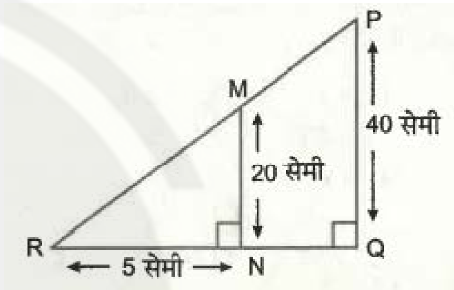
(A) $\frac{(OP)^2}{(KC)^2}$

(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	Q6	B
Q2	A	Q7	A
Q3	A	Q8	C
Q4	A	Q9	C
Q5	B	Q10	A

Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

Given that $\angle \mathrm{ADE}=\angle \mathrm{ABC}$ and $\angle \mathrm{A}$ is common to both triangles $\Delta \mathrm{ADE}$ and $\Delta \mathrm{ABC}$, we can conclude that $\Delta \mathrm{ADE} \sim \Delta \mathrm{ADE}$ by the angle - Angle (AA)

Set up the proportion of corresponding sides

Sine 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:

w/5 = 3/(3 + *x*)

2*x* = 15 – 6

2*x* = 9

x = 9/2

Video Solution:

Q2 Text Solution:

In BED and ACB, we have:

BED = ACB = 90°

B + C = 180°

BD AC

EBD = CAB (Alternate angles)

Therefore, by AA similarity theorem, we get:

BED~ ACB

BE/AC = DE/BC

BE/DE = AC/BC

This completes the proof.

Video Solution:

Q3 Text Solution:

Given: CAB=90°and AD BC

AC=75 cm,AB=1 m or 100 cm,

BC=1.25 m or 125 cm

In ΔBDA and ΔBAC,

BDA= BAC=90°

DBA= ABC(Common angle)

ΔBDA ΔBAC(By AA similarity criterion)

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

Consider, AB/BC=AD/AC

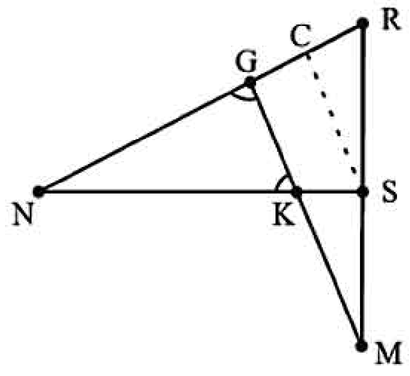
100/125=AD/75

AD=100×75/125

AD=60 cm

Video Solution:

Q4 Text Solution:



Draw: CS||GM.

In ΔGKN,

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

In $\Delta\,\mathrm{NSC},\ \ \mathrm{CS}\,||\,\mathrm{GK}$

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

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

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

$\mathrm{NG}=2\mathrm{GC}$

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

In $\Delta\mathrm{RGM}$, $\mathrm{CS}||\mathrm{GM}$

$\frac{\mathrm{CG}}{\mathrm{RG}}=\frac{\mathrm{SM}}{\mathrm{RM}}$ (by corollary to B.P.T)

$\mathrm{CG}\times\mathrm{RM}=\mathrm{RG}\times\mathrm{SM}$

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

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

Video Solution:

Q5 Text Solution:

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

In $\Delta\,\mathrm{OAF}$ and $\Delta\,\mathrm{OBD}$,

∠AOF = ∠BOD (common)

∠OAF = ∠OBD (each 90°)

ΔOAF~ΔOBD

$\frac{\mathrm{OA}}{\mathrm{OB}}=\frac{\mathrm{FA}}{\mathrm{DB}}$ (by C.P.S.T.) ... eq$^{\mathrm{n}}$. (i)

$\therefore\ \ \Delta\,\mathrm{FAC}\sim\Delta\,\mathrm{EBC}$

(we proved using AA similarity)

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

$\Rightarrow\ \frac{\mathrm{FA}}{\mathrm{DB}}=\frac{\mathrm{AC}}{\mathrm{BC}}$ ... eq$^{\mathrm{n}}$. (ii)

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

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

$\Rightarrow\ \mathrm{OC}\times\mathrm{OB}-\mathrm{OA}\times\mathrm{OB}=\mathrm{OA}\times\mathrm{OB}-\mathrm{OC}\times\mathrm{OA}$

$\Rightarrow\ \mathrm{OC}\times\mathrm{OB}+\mathrm{OC}\times\mathrm{OA}=2(\mathrm{OA}\times\mathrm{OB})$

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

Video Solution:

Q6 Text Solution:

In ΔLMK and ΔPNK

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

$\angle K=\angle K$ (common)

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

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

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

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

Video Solution:

Q7 Text Solution:

In ΔPOQ

DE | | OQ (given)

PE/EQ = PD/DO..........(1)

In ΔPOR

DF | | OR (given)

PF/FR = PD/DO......... (2)

From equation (1) and (2)

PE/EQ = PF/FR = PD/DO

PE/EQ = PF/FR

In ΔPQR

PE/EQ = PF/FR

QR | | EF (Converse of Basic Proportionality theorem)

Video Solution:

Q8 Text Solution:

Consider triangles AFD and EBF,

ADB and CBD are alternate angles.

So, ADF= EBF .... (1)

and DFA= BFE [Vertically opposite angles]

By A.A.Similarity criterion,

AFD EFB

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

AF/EF=FD/FB

AF×FB=EF×FD

Video Solution:

Q9 Text Solution:

In ΔLOP and ΔLKC

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

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

By AA similarity criterion

$\Delta \mathrm{LOP} \sim \Delta \mathrm{LKC}$

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

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

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

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

Video Solution:

Q10 Text Solution:

As per the figure,

$\angle \mathrm{MNR} = \angle \mathrm{PQR} = 90^\circ$ *hence* Δ PQR *and* Δ MNR *are similar triangles.*

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

$\therefore NQ = RQ - RN = 10 - 5 = 5\ cm$

Hence option (a) is correct.

Video Solution: