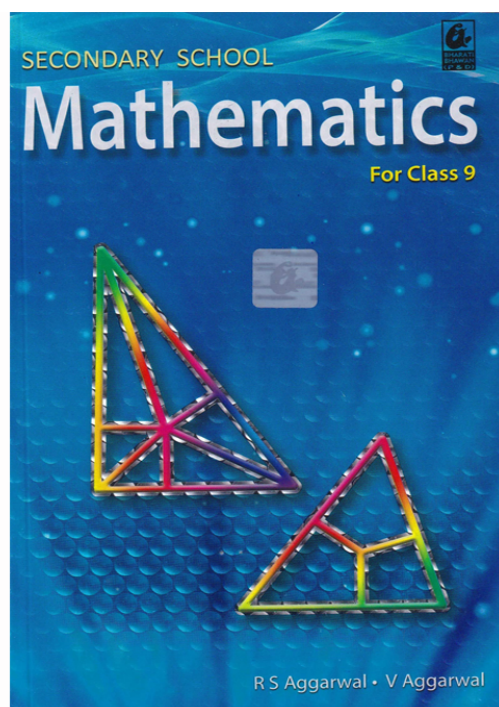


RS Aggarwal Solutions for Class 9

Maths Chapter 10–Area

Class 9 - Chapter 10 Area



For any clarifications or questions you can write to info@indcareer.com

Postal Address

IndCareer.com, 52, Shilpa Nagar, Somalwada Nagpur - 440015
Maharashtra, India

WhatsApp: +91 9561 204 888, **Website:** <https://www.indcareer.com>

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>



RS Aggarwal Solutions for Class 9 Maths Chapter 10–Area

Class 9: Maths Chapter 10 solutions. Complete Class 9 Maths Chapter 10 Notes.

RS Aggarwal Solutions for Class 9 Maths Chapter 10–Area

RS Aggarwal 9th Maths Chapter 10, Class 9 Maths Chapter 10 solutions

Question 1.

Solution:

Given : In the figure, ABCD is a quadrilateral and

$$AB = CD = 5\text{cm}$$

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

$$\angle ABD = 90^\circ \text{ and } \angle BDC = 90^\circ$$

To prove : ABCD is a ||gm.

Proof : In $\triangle ABD$ and $\triangle CDB$,

$$BD = BD \text{ (common)}$$

$$AB = CD \text{ (each 5cm)}$$

$$\angle B = \angle D \text{ (each } 90^\circ)$$

$$\therefore \triangle ABD \cong \triangle CDB \text{ (SAS axiom)}$$

$$\therefore AD = BC \text{ (c.p.c.t.)}$$

and $AB \parallel DC$ ($\because$ perpendiculars on BD)

$\therefore$ ABCD is a ||gm.

Now, area of ||gm ABCD

$$= \text{Base} \times \text{Altitude}$$

$$= AB \times BD$$

$$= 5 \times 7 \text{ cm}^2 = 35 \text{ cm}^2 \text{ Ans.}$$

Question 2.

Solution:

In ||gm ABCD,

$$AB = 10\text{cm, altitude DL} = 6\text{cm}$$

and BM is altitude on AD, and $BM = 8 \text{ cm}$.

$$\therefore \text{Area of ||gm ABCD} = \text{Base} \times \text{altitude}$$

$$= AB \times DL$$

$$= 10 \times 6 = 60 \text{ cm}^2$$

$$\text{Again, area of ||gm ABCD} = AD \times BM$$

$$\Rightarrow 60 = AD \times 8$$

$$\Rightarrow AD = \frac{60}{8} = \frac{15}{2} = 7.5 \text{ cm Ans.}$$

Question 3.**Solution:**

Diagonals of rhombus are 16cm and 24 cm.

Area = $\frac{1}{2}$ x product of diagonals

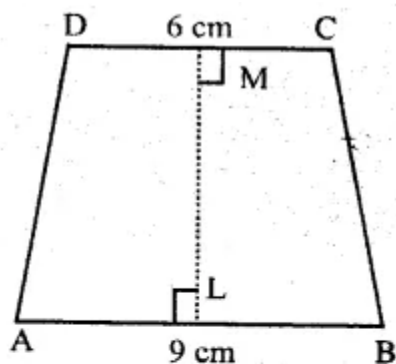
= $\frac{1}{2}$ x 1st diagonal x 2nd diagonal

= $\frac{1}{2}$ x 16 x 24

= 192 cm² Ans.

Question 4.**Solution:**

Parallel sides of a trapezium are 9cm and 6cm and distance between them is 8cm



$\therefore$ Area = $\frac{1}{2}$ (sum of parallel sides) $\times$ height

$$= \frac{1}{2} (AB + DC) \times LM$$

$$= \frac{1}{2} (9 + 6) \times 8 \text{ cm}^2$$

$$= \frac{1}{2} \times 15 \times 8 = 60 \text{ cm}^2 \text{ Ans.}$$

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

Question 5.

Solution:

from the figure

(i) In $\triangle BCD$, $\angle DBC = 90^\circ$

$$\therefore CD^2 = BD^2 + BC^2$$

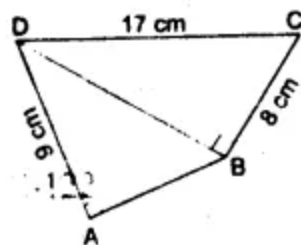
(Pythagoras Theorem)

$$\Rightarrow (17)^2 = BD^2 + (8)^2$$

$$\Rightarrow 289 = BD^2 + 64$$

$$\Rightarrow BD^2 = 289 - 64 = 225 = (15)^2$$

$$\therefore BD = 15\text{cm}$$



(i)

Similarly, in right $\triangle DAB$,

$$BD^2 = AD^2 + AB^2$$

$$(15)^2 = (9)^2 + AB^2$$

$$\Rightarrow 225 = 81 + AB^2$$

$$\Rightarrow AB^2 = 225 - 81 = 144 = (12)^2$$

$$\therefore AB = 12\text{cm}$$

Now, area of quad. ABCD

= area of right $\triangle ABD$ + area of right $\triangle BCD$

$$= \frac{1}{2} \times AB \times AD + \frac{1}{2} \times BC \times BD$$

$$= \frac{1}{2} \times 12 \times 9 + \frac{1}{2} \times 8 \times 15$$

$$= 54 + 60 = 114 \text{ cm}^2 \text{ Ans.}$$

(ii) In right $\triangle RTQ$ ($\because PT \perp PQ$)

$$RQ^2 = RT^2 + TQ^2$$

(Pythagoras Theorem)

$$\Rightarrow (17)^2 = RT^2 + (8)^2$$

$$\Rightarrow 289 = RT^2 + 64$$

$$RT^2 = 289 - 64 = 225 = (15)^2$$

$$\therefore RT = 15 \text{ cm}$$

$$PQ = PT + TQ = 8 + 8 = 16 \text{ cm}$$

Now, area of trapezium PQRS

$$= \frac{1}{2} (PQ + SR) \times RT$$

$$= \frac{1}{2} (16 + 8) \times 15 \text{ cm}^2$$

$$= \frac{1}{2} \times 24 \times 15 = 180 \text{ cm}^2 \text{ Ans.}$$

Question 6.

Solution:

In the fig, ABCD is a trapezium. $AB \parallel DC$

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

AB = 7cm, AD = BC = 5cm.

Distance between AB and DC = 4 cm.

i.e. $\perp AL = \perp BM = 4\text{cm}$.

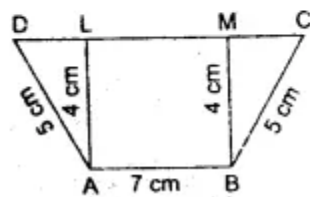
Now in right $\triangle ACD$,

$AD^2 = AL^2 + LD^2$. (Pythagoras Theorem).

$$\Rightarrow (5)^2 = (4)^2 + LD^2 \Rightarrow 25 = 16 + LD^2$$

$$\Rightarrow LD^2 = 25 - 16 = 9 = (3)^2$$

$$\therefore LD = 3\text{cm}$$



Similarly in right $\triangle BCM$

MC = 3cm.

Now DC = DL + LM + MC

$$= DL + AB + MC \quad (\because LM = AB)$$

$$= 3 + 7 + 3 = 13\text{cm}$$

Now area of trapezium ABCD

$$= \frac{1}{2} (AB + DC) \times AL$$

$$= \frac{1}{2} (7 + 13) \times 4\text{cm}^2$$

$$= \frac{1}{2} \times 20 \times 4 = 40 \text{ cm}^2 \text{ Ans.}$$

Question 7.

Solution:

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

Given : In quad. ABCD. $AL \perp BD$ and $CM \perp BD$.

To prove : $\text{ar}(\text{quad. ABCD})$

$$= \frac{1}{2} \times BD \times (AL + CM)$$

Proof : In $\triangle ABD$,

$$\text{area}(\triangle ABD) = \frac{1}{2} BD \times AL \dots(i)$$

$$\left(\frac{1}{2} \text{ Base} \times \text{altitude}\right)$$

$$\text{Similarly area}(\triangle BCD) = \frac{1}{2} BD \times CM \dots(ii)$$

Adding (i) and (ii),

$$\begin{aligned} \text{ar}(\triangle ABD) + \text{ar}(\triangle BCD) &= \frac{1}{2} BD \times AL + \\ &\frac{1}{2} BD \times CM \end{aligned}$$

$$\Rightarrow \text{ar}(\text{quad. ABCD}) = \frac{1}{2} BD (AL + CM)$$

Hence proved.

Question 8.

Solution:

In quad. ABCD, BD is its diagonal and $AL \perp BD$, $CM \perp BD$

BD = 14cm, AL = 8cm and CM = 6cm

∴ Area of quad. ABCD

$$= \frac{1}{2} \times BD (AL + CM)$$

$$= \frac{1}{2} \times 14 (8 + 6) = \frac{1}{2} \times 14 \times 14 \text{ cm}^2$$

$$= 98\text{cm}^2 \text{ Ans.}$$

Question 9.

Solution:

Given : ABCD is a trapezium in which AB || DC and its diagonals AC and BD intersect each other at O.

To prove : ar(Δ AOD) = ar(Δ BOC)

Proof : ∵ AB || DC

∴ Δ ABC and Δ ABD are on the same base AB and between the same parallels.

$$\therefore \text{ar}(\Delta ABC) = \text{ar}(\Delta ABD)$$

Subtracting ar(Δ OAB) from both sides.

$$\text{ar}(\Delta ABC) - \text{ar}(\Delta OAB) = \text{ar}(\Delta ABD) - \text{ar}(\Delta OAB)$$

$$\Rightarrow \text{ar}(\Delta AOD) = \text{ar}(\Delta BOC)$$

Hence proved.

Question 10.

Solution:

Given : In the figure,

DE || BC.

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

To prove : (i) $\text{ar}(\triangle ACD) = \text{ar}(\triangle ABE)$

(ii) $\text{ar}(\triangle OCE) = \text{ar}(\triangle OBD)$

Proof : (i) $\because DE \parallel BC$ (given)

and $\triangle ECD$ and $\triangle DBE$ are on the same base DE and between the same parallels

$\therefore \text{ar}(\triangle ECD) = \text{ar}(\triangle DBE)$

Adding $\text{ar}(\triangle ADE)$ to both sides,

$\text{ar}(\triangle ECD) + \text{ar}(\triangle ADE)$

$= \text{ar}(\triangle DBE) + \text{ar}(\triangle ADE)$

$\Rightarrow \text{ar}(\triangle ADC) = \text{ar}(\triangle ABE)$

(ii) $\because \text{ar}(\triangle ECD) = \text{ar}(\triangle DBE)$ (proved)

Subtracting $\text{ar}(\triangle ODE)$ from both sides,

$\text{ar}(\triangle ECD) - \text{ar}(\triangle ODE)$

$= \text{ar}(\triangle DBE) - \text{ar}(\triangle ODE)$

$\Rightarrow \text{ar}(\triangle OCE) = \text{ar}(\triangle OBD)$

Hence proved.

Question 11.

Solution:

Given : In $\triangle ABC$, D and E are the points on AB and AC such that

$\text{ar}(\triangle BCE) = \text{ar}(\triangle BCD)$

To prove : $DE \parallel BC$.

Proof : $(\triangle BCE) = \text{ar}(\triangle BCD)$

But these are on the same base BC .

Their altitudes are equal.

Hence $DE \parallel BC$

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

Hence proved.

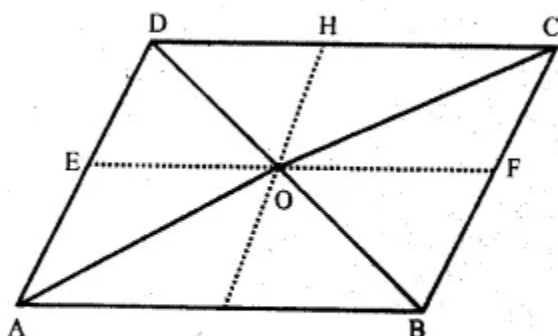
Question 12.

Solution:

Given : In $\parallel\text{gm ABCD}$, O is any. point inside the $\parallel\text{gm}$. OA, OB, OC and OD are joined.

To Prove : (i) $\text{ar}(\triangle OAB) + \text{ar}(\triangle OCD)$

$$= \frac{1}{2} \text{ar}(\parallel\text{gm ABCD})$$



(ii) $\text{ar}(\triangle OAD) + \text{ar}(\triangle OBC)$

$$= \frac{1}{2} \text{ar}(\parallel\text{gm ABCD})$$

Const. Draw EOF $\parallel$ AB and GOH $\parallel$ AD

Question 13.

Solution:

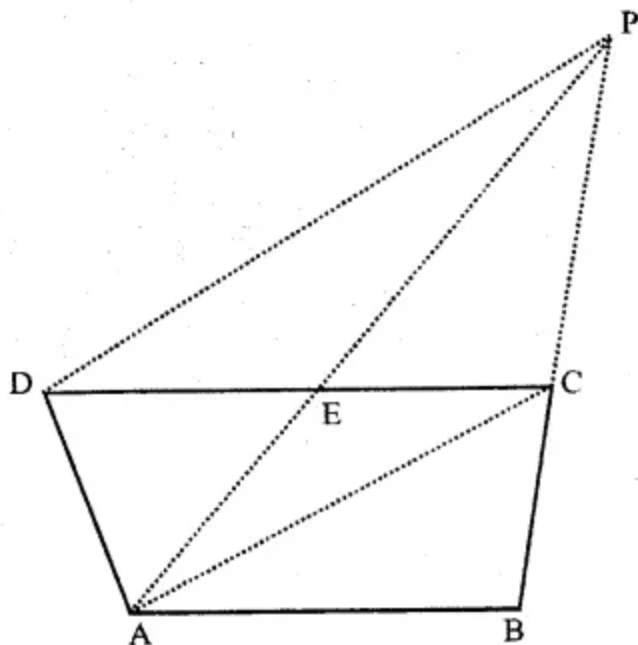
Given : In quad. ABCD.

A line through D, parallel to AC, meets 'BC produced in P. AP is joined which intersects CD at E.

To prove : $\text{ar}(\triangle ABP) = \text{ar}(\text{quad. ABCD})$.

Const. Join AC

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>



Proof : $\because \Delta APC$ and ΔADC are on the same base AC and between the same parallels.

$$\therefore \text{ar}(\Delta APC) = \text{ar}(\Delta ADC)$$

Subtracting $\text{ar}(\Delta AEC)$ from both sides.

$$\text{ar}(\Delta APC) - \text{ar}(\Delta AEC) = \text{ar}(\Delta ADC) - \text{ar}(\Delta AEC)$$

$$\Rightarrow \text{ar}(\Delta ECP) = \text{ar}(\Delta AED)$$

Adding $\text{ar}(\text{quad. } ABCE)$ both sides,

$$\text{ar}(\Delta ECP) + \text{ar}(\text{quad. } ABCE)$$

$$= \text{ar}(\Delta AED) + \text{ar}(\text{quad. } ABCE)$$

$$\Rightarrow \text{ar}(\Delta ABP) = \text{ar}(\text{quad. } ABCD)$$

Hence proved.

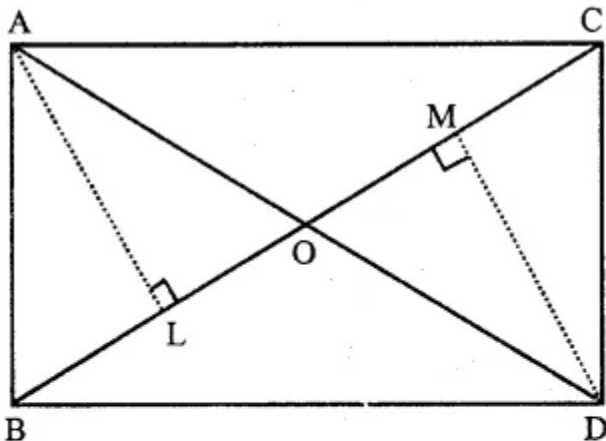
Question 14.

Solution:

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

Given : $\triangle ABC$ and $\triangle DBC$ are on the same base BC with points A and D on , opposite sides of BC and

$$\text{ar}(\triangle ABC) = \text{ar}(\triangle DBC).$$



To prove : BC bisects AD .

Const. Draw $AL \perp BC$ and $DM \perp BC$.

Proof : $\because \text{ar}(\triangle ABC) = \text{ar}(\triangle DBC)$

and these on the same base BC

$\therefore$ Their altitudes are equal

$$\therefore AL = DM$$

Now, in $\triangle ALO$ and $\triangle DMO$

$$AL = DM \text{ (proved)}$$

$$\angle AOL = \angle DOM$$

(vertically opposite angles)

$$\angle L = \angle M \text{ (each } 90^\circ)$$

$$\therefore \triangle ALO \cong \triangle DMO \text{ (AAS axiom)}$$

$$\therefore AO = OD \text{ (c.p.c.t)}$$

Hence, BC bisects AD .

Hence proved.

Question 15.

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

Solution:

Given : In $\triangle ABC$, AD is the median and P is a point on AD

BP and CP are joined

To prove : (i) $\text{ar}(\triangle BDP) = \text{ar}(\triangle CDP)$

(ii) $\text{ar}(\triangle ABP) = \text{ar}(\triangle ACP)$

Proof : In $\triangle PBC$, D is midpoint of BC

$\therefore$ PD divides $\triangle PBC$ into two triangle
 $\triangle PBD$ and $\triangle PCD$ in equal area

$$\therefore \text{ar}(\triangle BDP) = \text{ar}(\triangle CDP) \quad \dots(i)$$

Similarly in $\triangle ABC$,

AD is the medians

$$\therefore \text{ar}(\triangle ABD) = \text{ar}(\triangle ACD) \quad \dots(ii)$$

Subtracting (i) from (ii)

$$\text{ar}(\triangle ABD) - \text{ar}(\triangle BDP) = \text{ar}(\triangle ACD) - \text{ar}(\triangle CDP)$$

$$\Rightarrow \text{ar}(\triangle ABP) = \text{ar}(\triangle ACP)$$

Hence proved.

Question 16.**Solution:**

Given : In quad. ABCD, diagonals AC and BD intersect each other at O and $BO = OD$

To prove : $\text{ar}(\triangle ABC) = \text{ar}(\triangle ADC)$

Proof : In $\triangle ABD$,

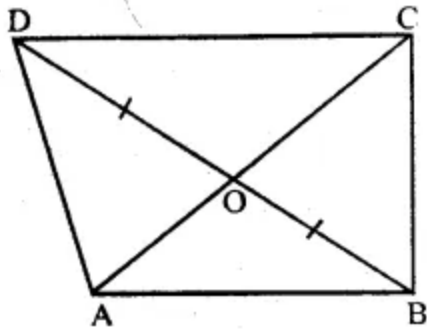
Proof : In $\triangle ABD$,

$$OB = OD$$

$\therefore$ AO is median of BD

$$\therefore \text{ar}(\triangle ABO) = \text{ar}(\triangle ADO) \quad \dots(i)$$

Similarly in $\triangle BCD$,



Question 17.

Solution:

In $\triangle ABC$, D is mid point of BC

and E is midpoint of AD and BE is joined.

To prove : $\text{ar}(\Delta BED) = \frac{1}{4} \text{ar}(\Delta ABC)$

Proof : In ΔABC ,

D is midpoint of BC

$\therefore$ AD is median

$\therefore \text{ar}(\Delta ABD) = \text{ar}(\Delta ACD)$

$\Rightarrow \text{ar}(\Delta ABD) = \frac{1}{2} \text{ar}(\Delta ABC)$

Again in ΔABD ,

E is midpoint of AD

$\therefore$ BE is the median of ΔABD

$\therefore \text{ar}(\Delta BED) = \text{ar}(\Delta AEB)$

$\Rightarrow \text{ar}(\Delta BED) = \frac{1}{2} \text{ar}(\Delta ABD) \dots(ii)$

from (i) and (ii),

$$\text{ar}(\Delta BED) = \frac{1}{2} \text{ar}(\Delta ABD)$$

$$= \frac{1}{2} \times \frac{1}{2} \text{ar}(\Delta ABC)$$

$$= \frac{1}{4} \text{ar}(\Delta ABC)$$

Hence proved.

Question 18.

Solution:

Given : In ΔABC . D is a point on AB and AD is joined. E is mid point of AD EB and EC are joined.

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

To prove : $\text{ar}(\triangle BEC) = 12 \text{ ar}(\triangle ABC)$

Proof : In $\triangle ABD$,

E is midpoint of AD

BE is its median

$$\text{ar}(\triangle EBD) = \text{ar}(\triangle ABE)$$

$$\Rightarrow \text{ar}(\triangle EBD) = \frac{1}{2} \text{ar}(\triangle ABD) \quad \dots(i)$$

Similarly in $\triangle ACD$,

CE is the median

$$\therefore \text{ar}(\triangle CED) = \text{ar}(\triangle CEA)$$

$$\Rightarrow \text{ar}(\triangle CED) = \frac{1}{2} \text{ar}(\triangle ACD) \quad \dots(ii)$$

Adding (i) and (ii)

$$\text{ar}(\triangle EBD) + \text{ar}(\triangle CED)$$

$$= \frac{1}{2} \text{ar}(\triangle ABD) + \frac{1}{2} \text{ar}(\triangle ACD)$$

$$\Rightarrow \text{ar}(\triangle BEC) = \frac{1}{2} [\text{ar}(\triangle ABD) + \text{ar}(\triangle ACD)]$$

$$= \frac{1}{2} \text{ar}(\triangle ABC) \quad \text{Hence proved.}$$

Question 19.

Solution:

Given : In $\triangle ABC$, D is midpoint of BC and E is the midpoint of AD. BO is the median of $\triangle ABC$ and O is the midpoint of BE.

To prove that $\text{ar}(\triangle BOE) = \frac{1}{18} \text{ar}(\triangle ABC)$.

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

Proof : In ΔABC , D is midpoint of BC

$\therefore$ AD is the median of ΔABC

$$\therefore \text{ar}(\Delta ABD) = \text{ar}(\Delta ACD)$$

$$\Rightarrow \text{ar}(\Delta ABD) = \frac{1}{2} \text{ar}(\Delta ABC) \quad \dots(i)$$

Similarly in ΔABD .

E is midpoint of BD

$\therefore$ AE is its median

$$\therefore \text{ar}(\Delta ABE) = \frac{1}{2} \text{ar}(\Delta ABD)$$

$$= \frac{1}{2} \times \frac{1}{2} \text{ar}(\Delta ABC) \quad [\text{from}(i)]$$

$$= \frac{1}{4} \text{ar}(\Delta ABC)$$

Again in ΔABE , O is midpoint of AE

$\therefore$ BO is its median

$$\therefore \text{ar}(\Delta BOE) = \frac{1}{2} \text{ar}(\Delta ABE)$$

$$= \frac{1}{2} \times \frac{1}{4} \text{ar}(\Delta ABC) \quad [\text{from}(ii)]$$

$$= \frac{1}{8} \text{ar}(\Delta ABC).$$

$$\text{Hence } \text{ar}(\Delta BOE) = \frac{1}{8} \text{ar}(\Delta ABC)$$

Hence proved.

Question 20.

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

Solution:

Given : In $\parallel\text{gm}$ ABCD, O is any point on diagonal AC.

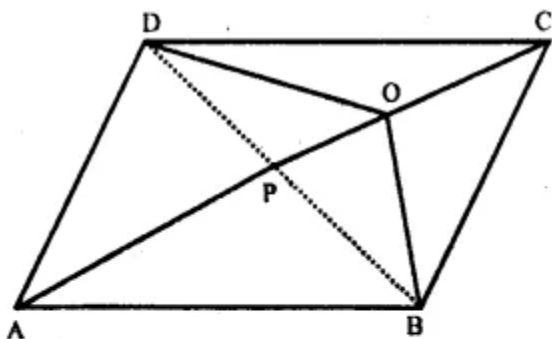
To prove : $\text{ar}(\triangle AOB) = \text{ar}(\triangle AOD)$

Const. Join BD which intersects AC at P

Proof : In $\triangle OBD$,

P is midpoint of BD

(Diagonals of $\parallel\text{gm}$ bisect each other)



$\therefore$ OP is its median

$$\therefore \text{ar}(\triangle OBP) = \text{ar}(\triangle ODP) \quad \dots(i)$$

Similarly in $\triangle ABD$,

P is midpoint of BD

$\therefore$ AP is its median

$$\therefore \text{ar}(\triangle ABP) = \text{ar}(\triangle ADP) \quad \dots(ii)$$

Adding (i) and (ii)

$$\text{ar}(\triangle OBP) + \text{ar}(\triangle ABP)$$

$$= \text{ar}(\triangle ODP) + \text{ar}(\triangle ADP)$$

$$\Rightarrow \text{ar}(\triangle AOB) = \text{ar}(\triangle AOD)$$

Hence proved.

Question 21.

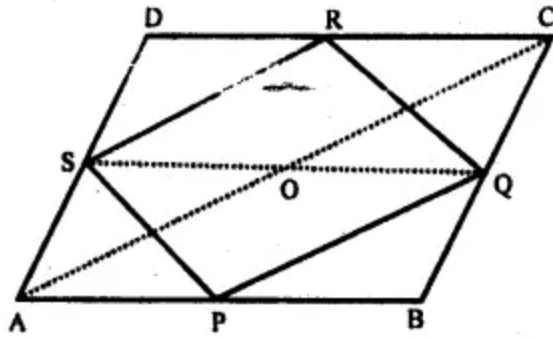
<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

Solution:

Given : ABCD is a ||gm.

P, Q, R and S are the midpoints of sides AB, BC, CD, DA respectively.

PQ, QR, RS and SP are joined.



To prove : (i) PQRS is a ||gm.

$$(ii) \text{ar}(\text{||gm PQRS}) = \frac{1}{2} \text{ar}(\text{||gm ABCD})$$

Const : Join AC and QS.

Proof : (i) In $\triangle ABC$,

P and Q are the midpoints of AB and BC

$$\therefore PQ \parallel AC \text{ and } PQ = \frac{1}{2} AC \quad \dots(i)$$

Similarly in $\triangle ADC$,

S and R are the midpoints of AD and DC

$$\therefore SR \parallel AC \text{ and } SR = \frac{1}{2}AC \quad \dots(ii)$$

from (i) and (ii),

$$PQ \parallel SR \text{ and } PQ = SR$$

$\therefore$ PQRS is a ||gm

(ii) $\therefore$ SQ is the diagonal of ||gm PQRS.

$\therefore$ It divides the ||gm PQRS into two triangles PQS and RSQ of equal area.

$\therefore$ S and Q are the midpoints of AD and BC

$$\therefore SQ \parallel AB \parallel DC$$

$\therefore$ ABQS and SQCD are parallelograms.

Now ΔPQS and ||gm ABQS are on the same base SQ and between the same parallels.

$$\therefore \text{ar}(\Delta PQS) = \frac{1}{2} \text{ar}(\text{||gm ABQS}) \quad \dots(iii)$$

Similarly, ΔRQS and $\parallel gm SQCD$ are on the same base SQ and between the same parallels.

$$\therefore ar(\Delta RQS) = \frac{1}{2} ar(\parallel gm SQCD) \dots(iv)$$

Adding (iii) and (iv),

$$ar(\Delta PQS) + ar(\Delta RQS) = \frac{1}{2} ar(\parallel gm APQS) + \frac{1}{2} ar(\parallel gm SQCD)$$

$$\begin{aligned} \Rightarrow ar(\parallel gm PQRS) &= \frac{1}{2} [ar(\parallel gm APQS) \\ &+ ar(\parallel gm SQCD)] \\ &= \frac{1}{2} \times ar(\parallel gm ABCD) \end{aligned}$$

Hence proved.

Question 22.

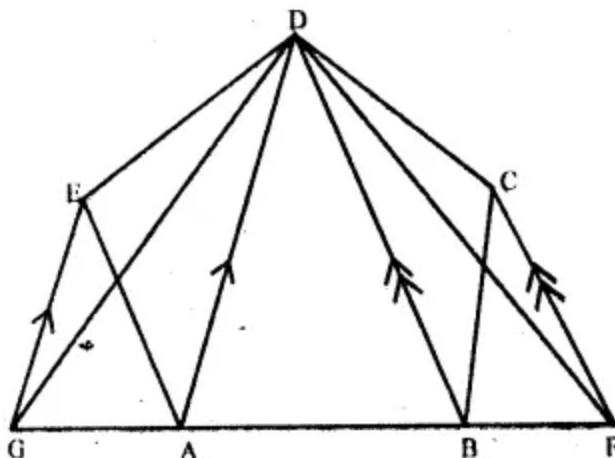
Solution:

Given : In pentagon $ABCDE$,

$EG \parallel DA$ meets BA produced and

$CF \parallel DB$, meets AB produced.

To prove : $ar(\text{pentagon } ABCDE) = ar(\Delta DGF)$



Const. : Join DG and DF.

Proof : $\therefore \Delta AGD$ and ΔAED are on the same base AD and between the same parallels.

$$\therefore \text{ar}(\Delta AGD) = \text{ar}(\Delta AED) \quad \dots(i)$$

Similarly ΔBFD and ΔBCD are on the same base and between the same parallels

$$\therefore \text{ar}(\Delta BFD) = \text{ar}(\Delta BCD) \quad \dots(ii)$$

Adding (i) and (ii),

$$\text{ar}(\Delta AGD) + \text{ar}(\Delta BFD) = \text{ar}(\Delta AED) + \text{ar}(\Delta BCD)$$

Adding $\text{ar}(\Delta ADB)$ to both sides

$$\begin{aligned} \text{ar}(\Delta AGD) + \text{ar}(\Delta BFD) + \text{ar}(\Delta ADB) \\ = \text{ar}(\Delta AED) + \text{ar}(\Delta BCD) + \text{ar}(\Delta ADB) \\ \Rightarrow \text{ar}(\Delta GDF) = \text{ar}(ABCDE). \end{aligned}$$

Hence proved.

Question 23.

Solution:

Given ; A ΔABC in which AD is the median.

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

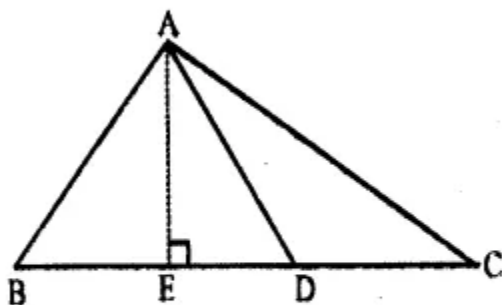
To prove ; ar($\triangle ABD$) = ar($\triangle ACD$)

Const : Draw $AE \perp BC$.

Proof : Area of $\triangle ABD$

$$= \frac{1}{2} \times BD \times AE \quad \dots(i)$$

$$(\because \text{ar } \triangle = \frac{1}{2} \text{ Base} \times \text{altitude})$$



$$\text{and area of } \triangle ACD = \frac{1}{2} DC \times AE$$

But D is midpoint of BC.

$$\therefore BD = DC$$

$$\therefore \text{area of } \triangle ACD = \frac{1}{2} \times BD \times AE \quad \dots(ii)$$

From (i) and (ii),

$$\text{area } (\triangle ABD) = \text{area } (\triangle ACD)$$

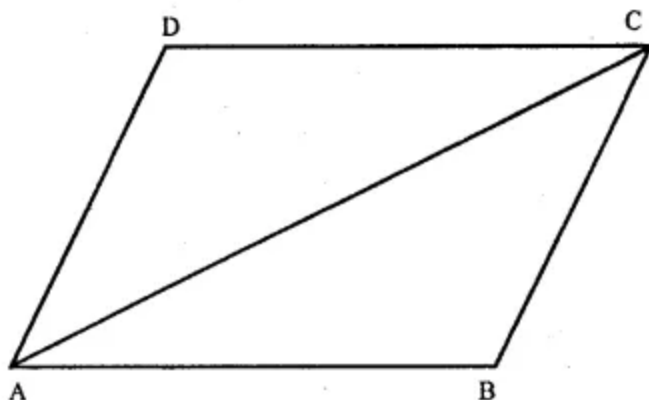
Hence proved.

Question 24.

Solution:

Given : A ||gm ABCD in which AC is its diagonal which divides ||gm ABCD in two $\triangle ABC$ and $\triangle ADC$.

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>



To prove : $\text{ar}(\triangle ABC) = \text{ar}(\triangle ADC)$

Proof : $\because \triangle ABC$ and $\parallel\text{gm } ABCD$ are on the same base AB and between the same parallels

$$\therefore \text{ar}(\triangle ABC) = \frac{1}{2} \text{ar}(\parallel\text{gm } ABCD) \dots(i)$$

Again $\triangle ADC$ and $\parallel\text{gm } ABCD$ are on the same base CD and between the same parallels

$$\therefore \text{ar}(\triangle ADC) = \frac{1}{2} \text{ar}(\parallel\text{gm } ABCD) \dots(ii)$$

From (i) and (ii)

$$\text{area}(\triangle ABC) = \text{area}(\triangle ADC)$$

Hence diagonal divides the $\parallel\text{gm}$ into two triangles of equal area.

Question 25.

Solution:

Given : In $\triangle ABC$,

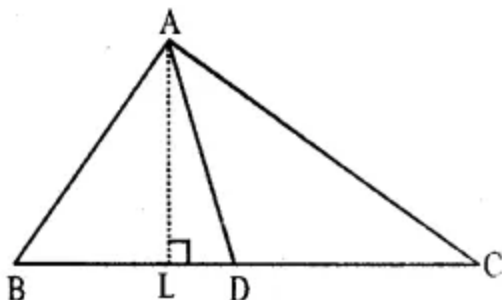
D is a point on BC such that

$$BD = 12 DC$$

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

AD is joined.

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>



To prove. $\text{ar}(\triangle ABD) = \frac{1}{3} \times \text{ar}(\triangle ABC)$

Const. Draw $AL \perp BC$

Proof : $\because BD = \frac{1}{2} DC$

$\therefore 2BD = DC$

Adding BD both sides

$2BD + BD = BD + DC$

$\Rightarrow 3BD = BC \Rightarrow BD = \frac{1}{3} BC \dots(i)$

We know area of a triangle = $\frac{1}{2}$ Base $\times$ altitude

$$\therefore \text{Area of } \triangle ABD = \frac{1}{2} \times BD \times AL \dots(ii)$$

$$\text{and area of } \triangle ABC = \frac{1}{2} BC \times AL \dots(iii)$$

$$\text{Now, area of } (\triangle ABD) = \frac{1}{2} \times \frac{1}{3} BC \times AL \text{ [from (i)]}$$

$$= \frac{1}{3} \left(\frac{1}{2} BC \times AL \right)$$

$$= \frac{1}{3} \text{ar}(\triangle ABC) \text{ [from (iii)]}$$

Hence proved.

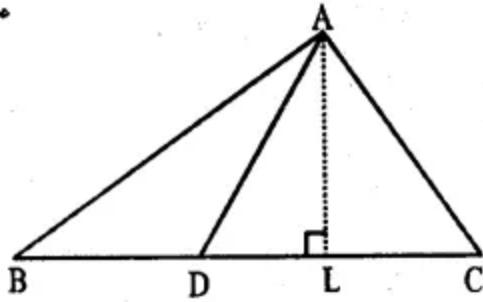
Question 26.

Solution:

Given : In $\triangle ABC$, D is a point on BC such that

$$BD : DC = m : n$$

AD is joined.



To prove : $\text{ar}(\triangle ABD) : \text{ar}(\triangle ADC) = m : n$

Const. Draw $AL \perp BC$

Proof : $\because BD : DC = m : n$

$$\Rightarrow \frac{BD}{DC} = \frac{m}{n}$$

Now, area of $\triangle ABD = \frac{1}{2} BD \times AL \dots(i)$

[$\because$ area of a triangle = $\frac{1}{2}$ Base $\times$ Altitude)

and area of $\Delta ADC = \frac{1}{2} DC \times AL \dots(ii)$

$$\therefore \frac{ar(\Delta ABD)}{ar(\Delta ADC)} = \frac{\frac{1}{2} BD \times AL}{\frac{1}{2} DC \times AL} = \frac{BD}{DC}$$

But $\frac{BD}{DC} = \frac{m}{n}$

$$\therefore \frac{ar(\Delta ABD)}{ar(\Delta ADC)} = \frac{m}{n}$$

Hence $ar(\Delta ABD) : ar(\Delta ADC) = m : n$

Hence proved.



RS Aggarwal Class 9 Solutions

- Chapter 1–Real Numbers
- Chapter 2–Polynomials
- Chapter 3–Introduction to Euclid’s Geometry
- Chapter 4–Lines and Triangles
- Chapter 5–Congruence of Triangles and Inequalities in a Triangle
- Chapter 6–Coordinate Geometry
- Chapter 7–Areas
- Chapter 8–Linear Equations in Two Variables
- Chapter 9–Quadrilaterals and Parallelograms
- Chapter 10–Area
- Chapter 11–Circle
- Chapter 12–Geometrical Constructions
- Chapter 13–Volume and Surface Area
- Chapter 14–Statistics
- Chapter 15–Probability

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

About RS Aggarwal Class 9 Book

Investing in an R.S. Aggarwal book will never be of waste since you can use the book to prepare for various competitive exams as well. RS Aggarwal is one of the most prominent books with an endless number of problems. R.S. Aggarwal's book very neatly explains every derivation, formula, and question in a very consolidated manner. It has tonnes of examples, practice questions, and solutions even for the NCERT questions.

He was born on January 2, 1946 in a village of Delhi. He graduated from Kirori Mal College, University of Delhi. After completing his M.Sc. in Mathematics in 1969, he joined N.A.S. College, Meerut, as a lecturer. In 1976, he was awarded a fellowship for 3 years and joined the University of Delhi for his Ph.D. Thereafter, he was promoted as a reader in N.A.S. College, Meerut. In 1999, he joined M.M.H. College, Ghaziabad, as a reader and took voluntary retirement in 2003. He has authored more than 75 titles ranging from Nursery to M. Sc. He has also written books for competitive examinations right from the clerical grade to the I.A.S. level.

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

Frequently Asked Questions (FAQs)

Why must I refer to the RS Aggarwal textbook?

RS Aggarwal is one of the most important reference books for high school grades and is recommended to every high school student. The book covers every single topic in detail. It goes in-depth and covers every single aspect of all the mathematics topics and covers both theory and problem-solving. The book is true of great help for every high school student. Solving a majority of the questions from the book can help a lot in understanding topics in detail and in a manner that is very simple to understand. Hence, as a high school student, you must definitely dwell your hands on RS Aggarwal!

Why should you refer to RS Aggarwal textbook solutions on Indcareer?

RS Aggarwal is a book that contains a few of the hardest questions of high school mathematics. Solving them and teaching students how to solve questions of such high difficulty is not the job of any neophyte. For solving such difficult questions and more importantly, teaching the problem-solving methodology to students, an expert teacher is mandatory!

Does IndCareer cover RS Aggarwal Textbook solutions for Class 6-12?

RS Aggarwal is available for grades 6 to 12 and hence our expert teachers have formulated detailed solutions for all the questions of each edition of the textbook. On our website, you'll be able to find solutions to the RS Aggarwal textbook right from Class 6 to Class 12. You can head to the website and download these solutions for free. All the solutions are available in PDF format and are free to download!

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>

About IndCareer

IndCareer.com is a leading developer of online career guidance resources for the Indian marketplace. Established in 2007, IndCareer.com is currently used by over thousands of institutions across India, including schools, employment agencies, libraries, colleges and universities.

IndCareer.com is designed to assist you in making the right career decision - a decision that meets your unique interests and personality.

For any clarifications or questions you can write to **info@indcareer.com**

Postal Address

IndCareer.com
52, Shilpa Nagar,
Somalwada
Nagpur - 440015
Maharashtra, India

WhatsApp: +91 9561 204 888

Website: <https://www.indcareer.com>

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-9-maths-chapter-10-area/>