TRIANGLES

MCQs & A and R WORK SHEET

Test / Exam Name: Triangles | **Standard:** 10th | **Subject:** Mathematics

Student Name: ______________ | **Section:** ______________ | **Roll No.:** ______________

Questions: 35	Time: 01:00 hh:mm	Negative Marks: 0	Marks: 35

Instructions

1. MULTIPLE CHOICE QUESTIONS.

Q1. Which of the following is not a similarity criterion for two triangles? **1 Mark**

A AAA **B** SAS **C** SSS **D** ASA

Ans: **D** ASA

Solution:

The main criteria for similarity of two triangles are AAA, AA, SAS and SSS.

Q2. Which of the following are not similar figu: **1 Mark**

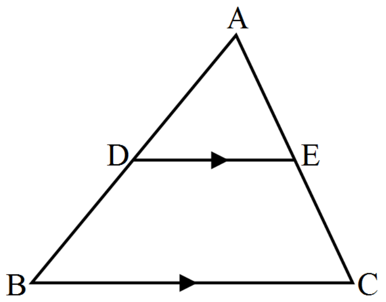
A Circles **B** Squares **C** Equilateral triangles **D** Isosceles triangles

Ans: **D** Isosceles triangles

Solution:

All circles, squares, and equilateral triangles are similar figures.

Q3. In a $\triangle ABC$, if DE is drawn parallel to BC, cutting AB and AC at D and E respectively such that AB = 7.2cm, AC = 6.4cm and AD = 4.5cm. Then, AE =? **1 Mark**



A 5.4cm **B** 4cm **C** 3.6cm **D** 3.2cm

Ans: **B** 4cm

Solution:

In $\triangle ABC$, DE || BC

By Basic proportionality theorem,

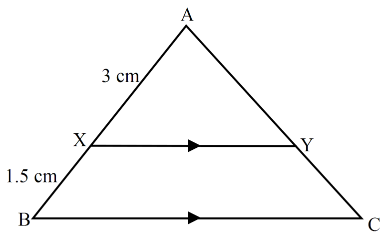
$$\frac{AE}{AC} = \frac{AD}{AB}$$

$$\Rightarrow \frac{AE}{6.4} = \frac{4.5}{7.2}$$

$$\Rightarrow AE = \frac{4.5 \times 6.4}{7.2}$$

$$\Rightarrow AE = 4cm$$

Q4. In the given figure XY ∥ BC. If AX = 3cm, XB = 1.5cm and BC = 6cm, then XY is equal to: **1 Mark**



A 4cm. **B** 6cm. **C** 4.5cm **D** 3cm.

Ans: **A** 4cm.

Solution:

Since XY ∥ BC, then using thales theorem

$$\Rightarrow \frac{AX}{AB} = \frac{XY}{BC}$$

$$\Rightarrow \frac{3}{4.5} = \frac{XY}{6}$$

$$\Rightarrow XY = 4cm$$

Q5. In $\triangle ABC$, it is given that AB = 9cm, BC = 6cm and CA = 7.5cm. Also, $\triangle DEF$ is given such that EF = 8cm and $\triangle DEF \sim \triangle ABC$. Then, perimeter of $\triangle DEF$ 1s: **1 Mark**

A 22.5cm **B** 25cm **C** 27cm **D** 30cm

Ans: **D** 30cm

Solution:

$\triangle ABC \sim \triangle DEF$

$\Rightarrow \frac{\text{Perimeters of } \triangle DEF}{\text{Perimeters of } \triangle ABC} = \frac{EF}{BC}$

$\Rightarrow \frac{\text{Perimeters of } \triangle DEF}{AB+BC+AC} = \frac{8}{6}$

$\Rightarrow \frac{\text{Perimeters of } \triangle DEF}{9+6+7.5} = \frac{8}{6}$

$\Rightarrow \frac{\text{Perimeters of } \triangle DEF}{22.5} = \frac{4}{3}$

$\Rightarrow$ Perimeters of $\triangle DEF = \frac{4 \times 22.5}{3}$

$\Rightarrow$ Perimeters of $\triangle DEF = 30\text{cm}$

Q6. In $\triangle ABC$ and $\triangle DEF$, it is given that $\angle B = \angle E$, $\angle F = \angle C$ and $AB = 3DE$, then the two triangles are: **1 Mark**

A Congruent but not similar **B** Similar but not congruent **C** Neither congruent not similar **D** Similar as well as congruent

Ans: **B** Similar but not congruent

Solution:

In $\triangle ABC$ and $\triangle DEF$,

It is given that $\angle B = \angle E$, $\angle F = \angle C$, and hence $\angle A = \angle D$

So, the two triangles are similar.

Since $AB = 3DE$

$\Rightarrow AB \neq DE$

So, the triangles are not congruent.

Thus, the two triangles are similar, but not cogruent.

Q7. It is given that $\triangle ABC \sim \triangle DFE$. If $\angle A = 30^\circ$, $\angle C = 50^\circ$, $AB = 5\text{cm}$, $AC = 8\text{cm}$ and $DF = 7.5\text{cm}$ then which of the following is true? **1 Mark**

A $DE = 12\text{cm}, \angle F = 50^\circ$ **B** $DE = 12\text{cm}, \angle F = 100^\circ$ **C** $EF = 12\text{cm}, \angle D = 100^\circ$ **D** $EF = 12\text{cm}, \angle D = 30^\circ$

Ans: **B** $DE = 12\text{cm}, \angle F = 100^\circ$

Solution:

Given that,

$\angle A = 30^\circ, \angle C = 50^\circ$

$\triangle ABC \sim \triangle DFE$

$\Rightarrow \angle A = \angle D = 30^\circ$

$\angle C = \angle E = 50^\circ$

Using angle sum property, we can find $\angle B = 100^\circ$

So, $\angle B = \angle F = 100^\circ$

Also, $AB = 5\text{cm}$, $AC = 8\text{cm}$ and $DF = 7.5\text{cm}$

$\frac{AB}{DF} = \frac{BC}{FE} = \frac{AC}{DE}$

$\Rightarrow \frac{5}{7.5} = \frac{BC}{FE} = \frac{8}{DE}$

$\Rightarrow \frac{5}{7.5} = \frac{8}{DE} \Rightarrow \frac{8 \times 7.5}{5} = 12\text{cm}$

Hence, $DE = 12\text{cm}$ and $\angle F = 100^\circ$

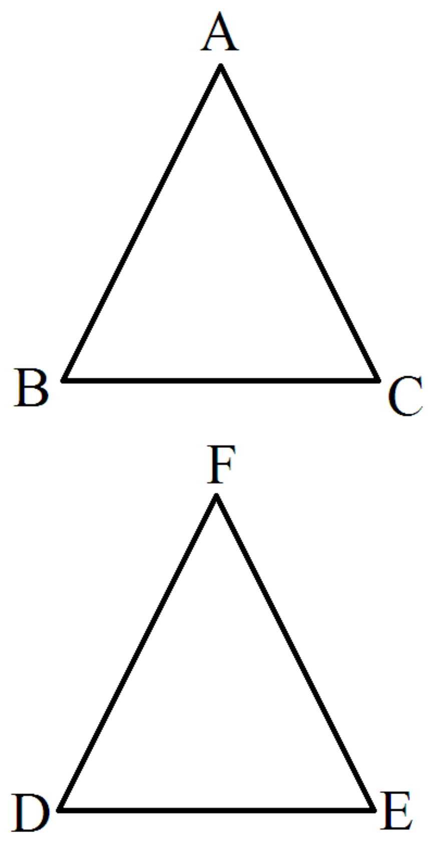
Q8. If in $\triangle ABC$ and $\triangle DEF$, $\frac{AB}{DE} = \frac{BC}{FD}$, then they will be similar, when: **1 Mark**

A $\angle B = \angle E$ **B** $\angle B = \angle D$ **C** $\angle A = \angle D$ **D** $\angle A = \angle F$

Ans: **B** $\angle B = \angle D$

Solution:

In $\triangle ABC$ and $\triangle DEF$, $\frac{AB}{DE} = \frac{BC}{FD}$, then if, $\angle b = \angle d$ (the included angles) are equal then the traingles are similar.



Q9. If △ABC ~ △DEF then which of the following is true? **1 Mark**

A BC.EF = AC.FD **B** BC.DE = AB.EF **C** AB.EF = AC.DE **D** BC.DE = AB.FD

Ans: **B** BC.DE = AB.EF

Solution:
If △ABC ~ △DEF then
BC.EF = AB.DE (corresponding sides are in problem)
Here according to the given coundition, BC.DE = AB.EF

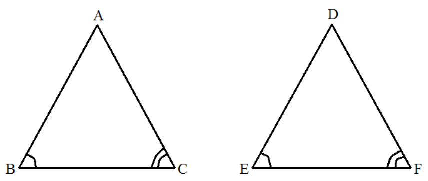
Q10. Choose the correct answer from the given four options: **1 Mark**

In triangles ABC and DEF, ∠B = ∠E, ∠F = ∠C and AB = 3 DE. Then, the two triangles are:

A Congruent but not similar. **B** Similar but not congruent. **C** Neither congruent nor similar.
D Congruent as well as similar.

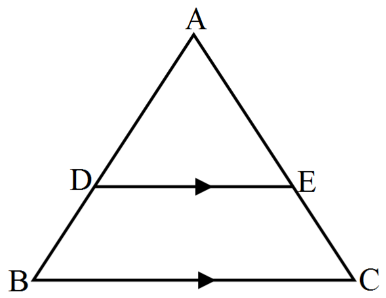
Ans: **B** Similar but not congruent.

2. similar but not congruent.
In △ABC and △DEF, ∠B = ∠E = ∠F and = AB = 3DE



We know that, if in two triangles corresponding two angles are same, then they are similar by AAA similarity criterion.
Also △ABC and △DEF do not satisfy any rule of congruency, (SAS, ASA, SSS), so both are not congruent.

Q11. In △ABC, DE || BC so that AD = (7x - 4)cm, AE = (5x - 2)cm, DB = (3x + 4)cm and EC = 3x cm. Then, we have: **1 Mark**



A x = 3 **B** x = 5 **C** x = 4 **D** x = 2.5

Ans: **C** x = 4

Solution:
In △ABC, DE || BC
By Basic proportionality theorem,

$\frac{AD}{DB} = \frac{AE}{EC}$

$\Rightarrow \frac{7x-4}{3x+4} = \frac{5x-2}{3x}$

$\Rightarrow 21x^2 - 12x = 15x^2 + 14x - 8$

$\Rightarrow 6x^2 - 26x + 8 = 0$

$\Rightarrow 3x^2 - 13x + 4 = 0$

$\Rightarrow (x - 4)(3x - 1) = 0$

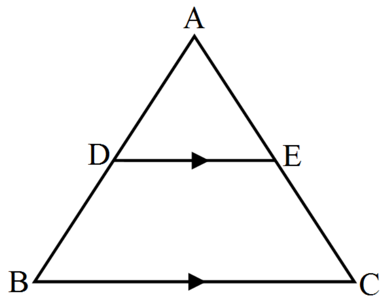
$\Rightarrow x = 4 \text{ or } x = \frac{1}{3}$

If $x = \frac{1}{3}$, then $AD = 7x - 4 = 7\left(\frac{1}{3}\right) - 4 = \frac{-5}{3} < 0$

This is not possible since length cannot be negative.

? x = 4

Q12. In $\triangle ABC$, $DE \,||\, BC$ such that $\frac{AD}{DB} = \frac{3}{5}$. AC = 5.6cm then AE =? **1 Mark**



A 4.2cm **B** 3.1cm **C** 2.8cm **D** 2.1cm

Ans: D 2.1cm

Solution:

In $\triangle ABC$, $DE \,||\, BC$

By Basic proportionality theorem,

$\frac{AD}{DB} = \frac{AE}{EC}$

$\Rightarrow \frac{AD}{DB} = \frac{AE}{AC - AE}$

$\Rightarrow \frac{3}{5} = \frac{AE}{5.6 - AE}$

$\Rightarrow 3(5.6 - AE) = 5AE$

$\Rightarrow 16.8 - 3AE) = 5AE$

$\Rightarrow 8AE = 16.8$

$\Rightarrow AE = 2.1\text{cm}$

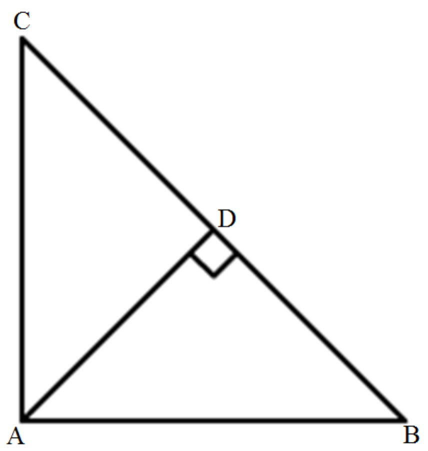
Q13. In an equilateral triangle ABC if $AD \perp BC$, then $AD^2 =$ **1 Mark**

A CD^2 **B** $2CD^2$ **C** $3CD^2$ **D** $4CD^2$

Ans: C $3CD^2$

Solution:

In an equilateral $\triangle ABC$, $AD \perp BC$



In $\triangle ADC$, applying Pythagoras theorem, we get,

$AC^2 = AD^2 + DC^2$

$BC^2 = AD^2 + DC^2$ ($\because$ AC = BC)

$(2DC)^2 = AD^2 + DC^2$ ($\because$ BC = 2DC)

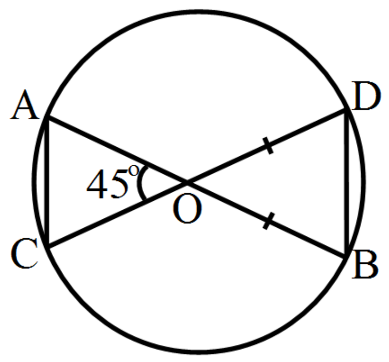
$4DC^2 = AD^2 + DC^2$

$3DC^2 = AD^2$

$3CD^2 = AD^2$

Hence, the correct option is C.

Q14. In the given figure, O is the point of intersection of two chords AB and CD such that OB = OD and $\angle AOC = 45°$. Then, $\triangle OAC$ and $\triangle ODB$ are: **1 Mark**



A Equilateral and similar. **B** Equilateral but not similar. **C** Isosceles and similar. **D** Isosceles but not similar.

Ans: C Isosceles and similar.

Solution:

In $\triangle AOC$ and $\triangle ODB$

$\angle AOC = \angle DOB$ ....(Vertically opposite angles)

$\angle OCA = \angle OBD$ ....(angels in the same segment)

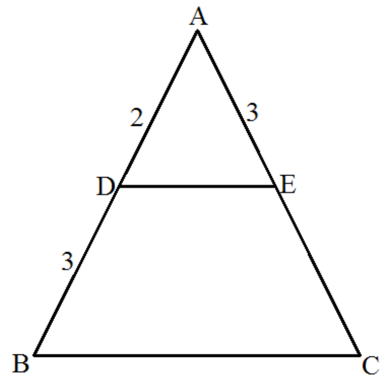
$\Rightarrow \triangle OAC \sim \triangle ODB$ ....(AA criterion for similarity)

The two triangles are surely not equil ateral,

Since the measure of every angle of an equilateral triangle is 60°.

So, the triangles are isosceles and similar.

Q15. In the given figure, if $\angle ADE = \angle ABC$, then CE = **1 Mark**



A 2 **B** 5 **C** $\frac{9}{2}$ **D** 3

Ans: C $\frac{9}{2}$

Solution:

Given: $\angle ADE = \angle ABC$

To find: The value of CE

Since $\angle ADE = \angle ABC$

$\therefore DE || BC$ (Two lines are parallel if the corresponding angles formed are equal)

According to basic proportionality theorem if a line is parallel to one side of a triangle intersecting the other two sides, then it divides the two sides in the same ratio.

In $\triangle ABC$, $DE || BC$

$\frac{AD}{DB} = \frac{AE}{EC}$

$\frac{2}{3} = \frac{3}{EC}$

$EC = \frac{3 \times 3}{2}$

$EC = \frac{9}{2}$

Hence we got the result C.

Q16. A vertical stick 20m long casts a shadow 10m long on the ground. At the same time, a tower casts a shadow 50m long on the ground. The height of the tower is: **1 Mark**

A 100m. **B** 120m. **C** 25m. **D** 200m.

Ans: A 100m.

Solution:

Height of a stick = 20m

and length of its shadow = 10m

At the same time

Let height of tower = x m

and its shadow = 50m

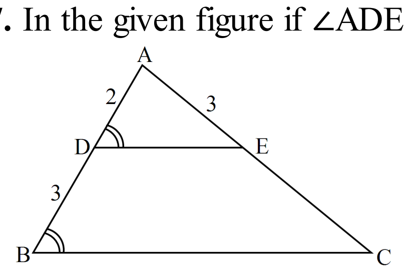
20 : x = 10 : 50

$x \times 10 = 20 \times 50$

$\Rightarrow x = \frac{20 \times 50}{10} = 100$

Height of tower = 100m.

Q17. In the given figure if $\angle ADE = \angle ABC$, $\angle ADE = \angle ABC$, then CE is equal to: **1 Mark**



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A 3. **B** $\frac{9}{2}$ **C** 2. **D** 5.

Ans: B $\frac{9}{2}$

Solution:

In △ABC and ADE,

$\triangle ADE = \angle ABC$[Given]

$\angle A = \angle A$[common]

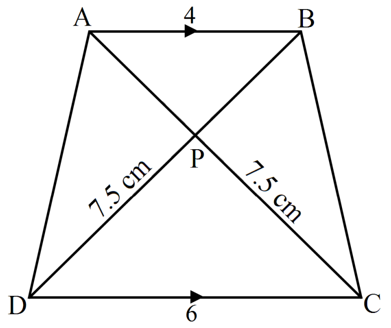
$\therefore \triangle ABC \sim \triangle ADE$[AA Similarity]

$\therefore \frac{AD}{DB} = \frac{AE}{EC}$

$=> \frac{2}{3} = \frac{3}{EC}$

$=> EC = \frac{9}{2}cm$

Q18. In the given figure, if AB ∥ DC then AP is equal to: **1 Mark**



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A 6cm. **B** 7cm. **C** 5.5cm. **D** 5cm

Ans: D 5cm

Solution:

In tiangles APB and CPD.

$\angle APB = \angle CPD$ [Vertically opposite angles] $\angle BAP = \angle ACD$ [Alternaet angles as AB ∥ CD

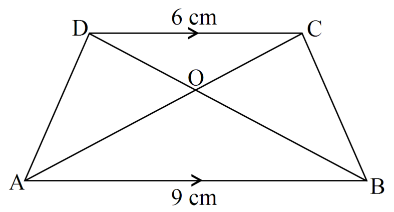
$\therefore \triangle APB \sim \triangle CPD$ [AA similarity]

$\therefore \frac{AB}{CD} = \frac{CP}{AP}$

$\Rightarrow \frac{4}{6} = \frac{AP}{7.5}$

$\Rightarrow AP = \frac{7.5 \times 4}{5cm}$

Q19. In trapezium ABCD, if AB∥DC, AB∥DC, AB = 9cm, DC = 6cm and BD = 12cm, then BO is equal to: **1 Mark**



A 7.4cm. **B** 7cm.. **C** 7.5cm. **D** 7.2cm

Ans: D 7.2cm

Solution:

In △COD and △AOB

$\angle DOC = \angle AOB$ [vertically opposite]

And $\angle DCO = \angle OAB$ [Alternate angles]

$\Rightarrow \triangle COD \sim \triangle AOB$ [similarity]

Let OB = xcm

$\therefore \frac{AB}{CD} = \frac{OB}{OD}$

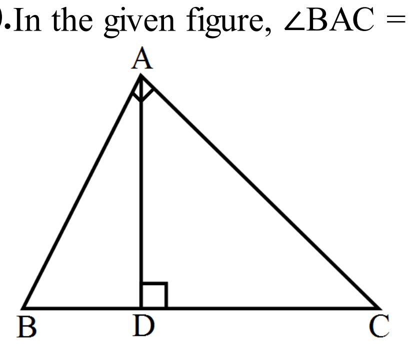
$\Rightarrow \frac{9}{6} = \frac{x}{12-x}$

$\Rightarrow 108 - 9x = 6x$

$\Rightarrow 15x = 108$

$\Rightarrow x = 7.2cm$

Q20. In the given figure, $\angle BAC = 90^\circ$ and $AD \perp BC$. Then: **1 Mark**

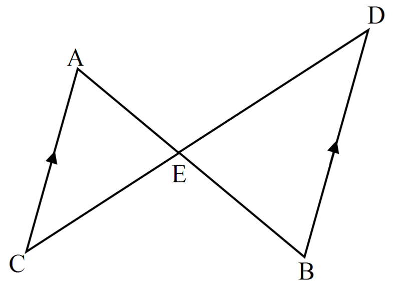


A $BC \cdot CD = BC^2$ **B** $AB \cdot AC = BC^2$ **C** $BD \cdot CD = AD^2$ **D** $AB \cdot AC = AD^2$

Ans: **C** $BD \cdot CD = AD^2$

Solution:
In $\triangle ABC$,
$\angle ABD = 90^\circ - \angle C$
Similarly, in $\triangle ACD$,
$\angle CAD = 90^\circ - \angle C$
In $\triangle DBA$ and $\triangle DAC$
$\angle ADB = \angle CDA = 90^\circ$
$\angle ABD = \angle CAD = 90^\circ - \angle C$
So, $\triangle DBA \sim \triangle DAC$ .....(AA criterion of similarity)
$\frac{BD}{AD} = \frac{AD}{CD}$
$\Rightarrow BD \cdot CD = AD^2$

Q21. In the adjoining figure AC∥BD.AC∥BD. If , EB = 4cm, ED = 8cm, AC = 6cm, AE = 3cm then CE and BD are respectively: **1 Mark**

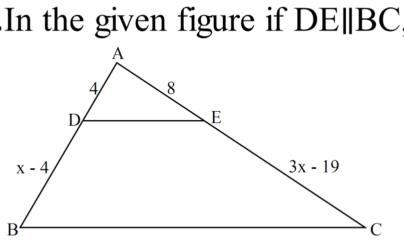


A 7.5cm, 9.5cm. **B** 6cm, 8cm. **C** 4cm, 6cm. **D** 5cm, 7cm.

Ans: **B** 6cm, 8cm.

Solution:
Given: $\frac{AC}{BD}$. and AC = 6cm, AE = 3cm, EB = 4cm, ED = 8cm.
In $\triangle ACE$ and DEB, $\angle AEC = \angle DEB$ [vertically opposite angles] $\angle ECA = \angle EDB$ Alternet angles as AC ∥ BD
$\therefore \triangle ACE \sim \triangle DEB$ [AA similarity]
$\therefore \frac{EB}{AE} = \frac{ED}{EC}$
$\Rightarrow \frac{4}{3} = \frac{8}{EC}$
$\Rightarrow EC = \frac{8 \times 3}{4} = 6cm$
Also $\frac{EB}{AE} = \frac{BD}{AC}$
$\Rightarrow \frac{4}{3} = \frac{BD}{6}$
$\Rightarrow BD = \frac{4 \times 6}{3} = 8cm$

Q22. In the given figure if DE∥BC, DE∥BC, then x is equal to: **1 Mark**



A 15. **B** 19. **C** 17. **D** 11.

Ans: **D** 11.

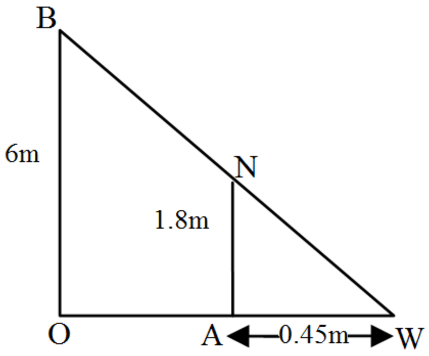
Solution:
Given: DE ∥ BC
$\therefore \frac{AD}{DB} = \frac{AE}{EC} \Rightarrow \frac{4}{x-4} = \frac{8}{3x-19}$ by using Thale's theorem
$\Rightarrow 4x = 44$
$\Rightarrow x = 44$

Q23. A vertical stick 1.8m long casts a shadow 45cm long on the ground. At the same time, what is the lenght of the shadow of a pole 6m high? **1 Mark**

A 2.4m **B** 1.35m **C** 1.5m **D** 13.5m

Ans: **C** 1.5m

Solution:



Let AN be the vertical stick and AW be its shadow.
Let OB be the pole and OW be its shadows.
AW = 45cm = 0.45m
AN = 1.8m
OB = 6m
Ratio of actual lengths = ratio of their shadows

$\Rightarrow \frac{OB}{AN} = \frac{OW}{AW}$

$\Rightarrow \frac{6}{1.8} = \frac{OW}{0.45}$

$\Rightarrow OW = \frac{6 \times 0.45}{1.8}$

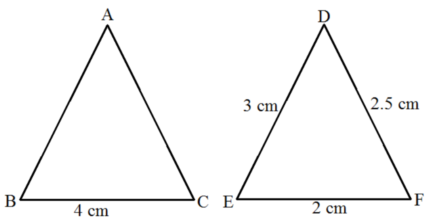
$\Rightarrow OW = 1.5m$

Q24. If $\triangle ABC \sim \triangle DEF$ such that DE = 3cm, EF = 2cm, DF = 2.5cm, BC = 4cm, then perimeter of $\triangle ABC$ is: **1 Mark**

A 18cm. **B** 20cm. **C** 12cm. **D** 15cm.

Ans: D 15cm.

Solution:



$\triangle ABC \sim \triangle DEF$
DE = 3cm, EF = 2cm, DF = 2.5cm, BC = 4cm
$\because \triangle ABC \sim \triangle DEF$
$\therefore$ Perimeter of $\triangle DEF$
= DE + EF + DF
= 3 + 2 + 2.5 = 7.5cm

Now $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF} = \frac{AB+BC+CA}{DE+EF+DF}$

$= \frac{4}{2} = \frac{AB+BC+CA}{7.5}$

$\Rightarrow AB + BC + CA = \frac{4 \times 7.5}{2} = 15$

$\therefore$ Perimeter of $\triangle ABC$ = 15cm.

Q25. Which of the following is a true statement? **1 Mark**

A Two similar triangles are always congruent. **B** Two figures are similar if they have the same shape and size.
C Two triangles are similar if their corresponding sides are proportional.
D Two polygons are similar if their corresponding sides are proportional.

Ans: C Two triangles are similar if their corresponding sides are proportional.

Solution:
1. Is incorrect. Since two similar triangles, may or may not be similar.
2. Holds even if the size is not the same.
3. Is surely true.
4. Holds only if for the polygon, the corresponding sides are proportional and the corresponding angles are equal.

Q26. If $\triangle ABC \sim \triangle DEF$ such that AB = 9.1cm and DE = 6.5cm. If the perimeter of $\triangle DEF$ is 25cm, then the perimeter of $\triangle ABC$ is: **1 Mark**

A 36cm. **B** 30cm. **C** 34cm. **D** 35cm.

Ans: D 35cm.

Solution:
Given: $\triangle ABC$ is similar to $\triangle DEF$ such that AB= 9.1cm, DE = 6.5cm. Perimeter of $\triangle DEF$ is 25cm.
To find: Perimeter of $\triangle ABC$.
We know that the ratio of corresponding sides of similar triangles is equal to the ratio of their perimeters.
Hence,

$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DE} = \frac{P1}{P2}$

$\frac{AB}{DE} = \frac{P(\triangle ABC)}{P(\triangle DEF)}$

$\frac{9.1}{6.5} = \frac{P(\triangle ABC)}{25}$

$P(\triangle ABC) = \frac{9.1 \times 25}{6.5}$

$P(\triangle ABC) = 35cm$

Hence the correct answer is D.

Q27. In a triangle, the perpendicular from the vertex to the base bisect the base. The triangle is: **1 Mark**

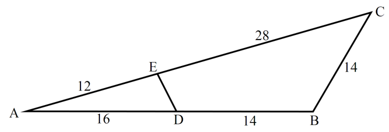
A Right-angled **B** Isosceles **C** Scalene **D** Obtuse-angled

Ans: B Isosceles

Solution:

In an isosceles triangle, the perpendicular from the vertex to the base bisects the base.

Q28. In the given figure if $\triangle AED \sim \triangle ABC$, then DE is equal to: **1 Mark**



A 5.6cm. **B** 6.5cm. **C** 7.5cm. **D** 5.5cm.

Ans: A 5.6cm.

Solution:

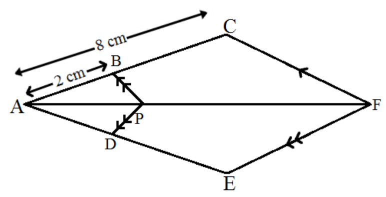
Since $\triangle AED \sim \triangle ABC$

$\therefore \frac{AE}{AB} = \frac{DE}{BC}$

$\Rightarrow \frac{12}{16+14} = \frac{DE}{14}$

$\Rightarrow DE = \frac{12 \times 14}{30} = \frac{84}{15} = 5.6cm$

Q29. In the figure, if PB || CF and DP || EF, then $\frac{AD}{DE} =$ **1 Mark**



A $\frac{3}{4}$. **B** $\frac{1}{3}$. **C** $\frac{1}{4}$. **D** $\frac{2}{3}$.

Ans: B $\frac{1}{3}$.

Solution:

In the figure, PB || CF, DP || EF

AB = 2cm, AC = 8cm

BC = AC - AB = 8 - 2 = 6cm

In $\triangle ACF$, $BP || CF$

$\therefore \frac{AB}{BC} = \frac{AP}{PF} = \frac{2}{6} = \frac{1}{3} \ldots. (1)$

In $\triangle AEF$, $DP || EF$

$\therefore \frac{AD}{DE} = \frac{AP}{PF} = \frac{1}{3}$ [From (2)]

$\frac{AD}{DE} = \frac{1}{3}$.

ASSERTION AND REASON QUESTIONS

Q30. DIRECTION: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as: **1 Mark**

Assertion: D and E are points on the sides AB and AC respectively of a $\triangle ABC$ such that AB = 10.8cm, AD = 6.3cm, AC = 9.6cm and EC = 4cm then DEis parallel to BC.

Reason: If a line is parallel to one side of a triangle then it divides the other two sides in the same ratio.

A Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false. **D** Assertion (A) is false but reason (R) is true

Ans: B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

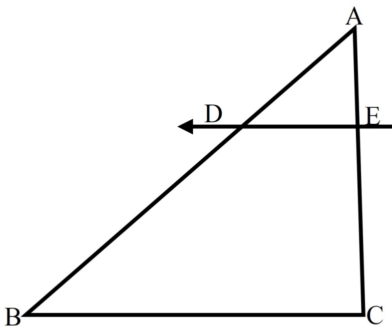
Solution:

We know that If a line is parallel to one side of atriangle then,

It divides the other two sidesin the same ratio. This is Basic Proportionality theorem.

A So, Reason is correct.

DB = 10.8 - 6.3 = 4.5 = cm and AE = 9.6 - 4 = 5.6cm



Now, $\frac{AD}{DB} = \frac{6.3}{4.5} == \frac{63}{45} = \frac{7}{5}$

and $\frac{AE}{EC} = \frac{5.6}{4} == \frac{56}{40} = \frac{7}{5}$

$\Rightarrow \frac{AD}{DB} = \frac{AE}{EC}$

By Converse of Basic Proportionality theorem, DE||BC.

Q31.Assertion: If $\triangle ABC$ and $\triangle PQR$ are congruent triangles, then they are also similar triangles. **1 Mark**

Reason: All congruent triangles are similar but the similar triangles need not be congruent.

A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false. **D** Assertion (A) is false but reason (R) is true.

Ans: **A** Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

1. Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Q32.Assertion: If a line intersects sides AB and AC of a $\triangle$ ABC at D and E respectively and is parallel to BC, then $\frac{AD}{AB} = \frac{AE}{AC}$ **1 Mark**

Reason: If a line is parallel to one side of a triangle then it divides the other two sides in the same ratio.

A Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false. **D** Assertion (A) is false but reason (R) is true

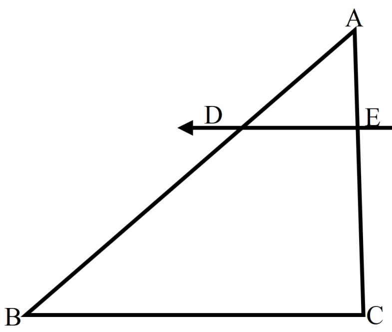
Ans: **A** Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

Solution:

We know that If a line is parallel to one side of a triangle then,

it divides the A other two sides in the same ratio.

This is Basic Proportionality theorem.



By Basic Proportionality theorem, we have $\frac{AD}{AB} = \frac{AE}{AC}$

$= \frac{DB}{AD} = \frac{EC}{AE}$

$= \frac{DB}{AD} + 1 = \frac{EC}{AE} + 1'$

$= \frac{DB+AD}{AD} = \frac{EC+AE}{AE}$

$= \frac{AB}{AD} = \frac{AC}{AE}$

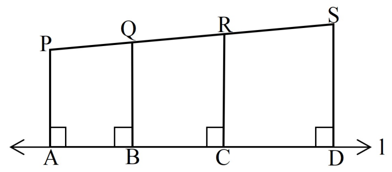
$= \frac{AD}{AB} = \frac{AE}{AC}$

So, Assertion is correct.

Q33.Assertion: In the given figure, PA || QB || RC || SD. **1 Mark**

Reason: If three or more line segments are perpendiculars to one line, then they are parallel to each other.

Reason (R): If three or more line segments are perpendiculars to one line, then they are parallel to each other.



1. Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
2. Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
3. Assertion (A) is true but reason (R) is false.
4. Assertion (A) is false but reason (R) is true.

A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false.

D Assertion (A) is false but reason (R) is true.

Ans: **A** Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

1. Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Q34.Assertion: D and E are points on the sides AB and AC respectively of a △ABC such that AD = 5.7cm, DB = 9.5cm, AE = 4.8cm and EC = 8cm then DEisnot parallel to BC. **1 Mark**

Reason: If a line divides any two sides of a triangle in the same ratio then it is parallel to the third side.

A Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false.

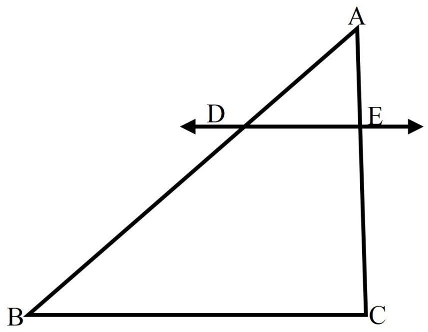
D Assertion (A) is false but reason (R) is true.

Ans: **D** Assertion (A) is false but reason (R) is true.

Solution:

If a line divides any two sides of a triangle in the same ratio then it is parallel to the third side. This is Converse of Basic Proportionality theorem.

So, Reason is correct.



Now, $\frac{AD}{DB} = \frac{5.7}{9.5} = \frac{57}{95} = \frac{3}{5}$

and $\frac{AE}{EC} = \frac{4.8}{8} = \frac{48}{8} = \frac{3}{5}$

$\Rightarrow \frac{AD}{DB} = \frac{AE}{EC}$

By Converse of Basic Proportionality theorem, DE| BC

So, Assertion is not correct.

Q35.DIRECTION: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as: **1 Mark**

Assertion: D and E are points on the sides AB and AC respectively of a △ABC such that DE || BCthen the value of x is 4, when AD = x cm, DB = (x - 2)cm, AE = (x + 2) cm and EC = (x - 1)cm.

Reason: If a line is parallel to one side of a triangle then it divides the other two sides in the same ratio.

A Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false.

D Assertion (A) is false but reason (R) is true

Ans: **A** Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

Solution:

By Basic Proportionality theorem, we have $\frac{AD}{DB} = \frac{AE}{EC}$

$\Rightarrow \frac{x}{x-2} = \frac{x+2}{x-1}$

? $x(x - 1) = (x - 2)(x + 2)$

? $x^2 - x = x^2 - 4$

? $x = 4cm$

So, Assertion is correct