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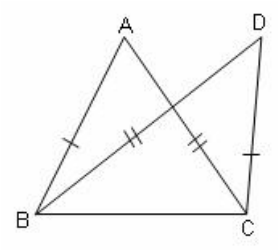
Class: IX
Subject: Math
Topic: Triangle
No. of Questions: 20
Duration: 60 Min
Maximum Marks: 60

1. Which of the following options is the correct relationship in the given figure?



A. $\Delta CBA \cong \Delta DCB$
B. $\angle A = \angle D$
C. $\Delta ABC \cong \Delta DBC$
D. $\angle ABC = \angle DBC$

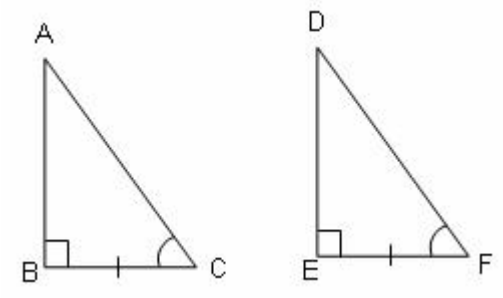
Solution: B

$\because$ In ΔABC and ΔDCB,
AB = DC [given]
AC = BD [given]
BC = CB [common]

$\Rightarrow$ $\Delta ABC \cong \Delta DCB$ [By SSS congruency rule]

$\therefore$ $\angle A = \angle D$ [By c.p.c.t. rule, i.e. corresponding parts of congruent triangles are equal.]

2. In the given figure, congruent parts are marked with identical signs. Which of the following options is the correct relationship?



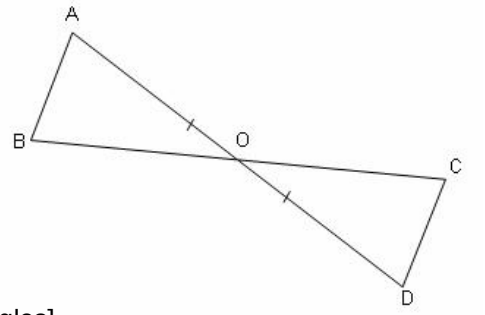
A. $\triangle BAC \cong \triangle EDF$
B. $\triangle ABC \cong \triangle EDF$
C. $\triangle ABC \cong \triangle FDE$
D. $\triangle ACB \cong \triangle DEF$

Solution: A

In $\triangle BAC$ and $\triangle EDF$,

$\angle ABC = \angle DEF$ [Each 90°]
$\angle ACB = \angle DFE$ [Given]
$BC = EF$ [Given]
$\Rightarrow \triangle BAC \cong \triangle EDF$ [By ASA rule]

3. In the given figure, AB || CD and O is the mid–point of AD. Which of the following options is the correct relationship?



A. $\angle A = \angle C$
B. $AO = OC$
C. $\triangle ABO \cong \triangle COD$
D. $BO = CO$

Solution: D

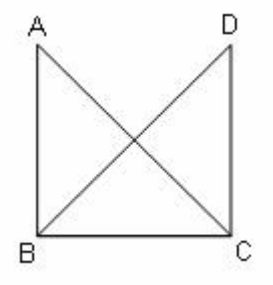
Right Answer Explanation:

In $\triangle AOB$ and $\triangle DOC$,

$\angle AOB = \angle DOC$ [vertically opposite angles]
$AO = DO$ [O is mid-point of AD.]
$\angle OAB = \angle ODC$ [$\because$ AB||CD (alternate interior angles)]

$\triangle AOB \cong \triangle DOC$ [By ASA rule]
BO = CO [By c.p.c.t rule]

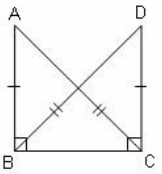
4. In the given figure, AB = CD and $\angle ABC = 90^0 = \angle DCB$. If AC = BD, which of the following options is the correct relationship?



A. $\triangle ABC \cong \triangle DCB$
B. $\triangle ABC \cong \triangle BCD$
C. $\triangle ABC \cong \triangle DBC$
D. $\triangle ACB \cong \triangle DCB$

Solution: A

In $\triangle ABC$ and $\triangle DCB$,



AB = CD [given]
$\angle ABC = \angle DCB$ [each 90°]
BC = CB [common]
$\therefore$ $\triangle ABC \cong \triangle DCB$ [By SAS rule]

5. Which of the following statements is correct?

A. Two squares are always of the same shape**.**
B. Two squares are always of the same shape and size.
C. A right triangle and an equilateral triangle can be of the same shape.
D. Two rectangles are always of the same size.

Solution: A

Two squares are always of the same shape as lengths of all the sides of a square are equal

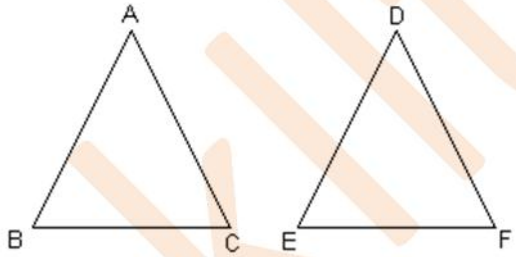
6. If $\triangle ABC \cong \triangle DEF$, which of the following options is definitely true?

A. AB = EF
B. BC = DE
C. $\angle CBA$ is the corresponding angle of $\angle EFD$
D. AB + BC + CA = DE + EF + DF

Solution: D

Right Answer Explanation:

If $\triangle ABC \cong \triangle DEF$, then AB = DE [Corresponding parts of congruent triangles]



BC = EF [Corresponding parts of congruent triangles]
CA = DF [Corresponding parts of congruent triangles]

Adding all these, we get

AB + BC + CA = DE + EF + DF

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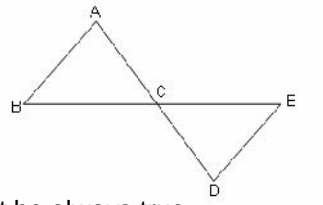
7. In the given figure, if $\triangle ABC \cong \triangle DEC$, which of the following statements is not always true



A. AB = DE
B. $\angle BAC = \angle EDC$
C. AB || DE
D. $\triangle ABC$ is an isosceles triangle

Solution: D

The statement '$\triangle ABC$ is an isosceles triangle' cannot be always true

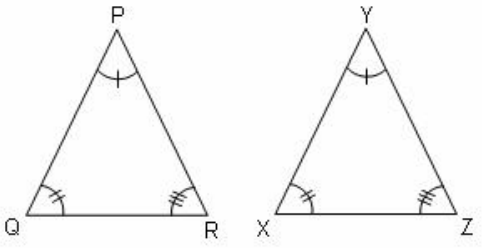
8. In $\triangle PQR$ and $\triangle XYZ$, $\angle P = \angle Y$, $\angle Q = \angle X$ and $\angle R = \angle Z$. Which of the following options represents the one–to–one correspondence between $\triangle PQR$ and $\triangle XYZ$?

A. PQR $\leftrightarrow$ XYZ
B. PRQ $\leftrightarrow$ YZX
C. PQR $\leftrightarrow$ XZY
D. RPQ $\leftrightarrow$ XYZ

Solution: B

From the figure, it is clear that P $\leftrightarrow$ Y, Q $\leftrightarrow$ X, R $\leftrightarrow$ Z

$\therefore$ PRQ $\leftrightarrow$ YZX

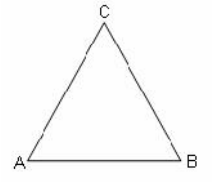


9. A, B and C are three points on a plane. If AB, BC and CA are joined, then

A. we will always get a triangle ABC
B. we will always get a straight line ABC
C. we will always get an angle ABC
D. we may or may not get a triangle

Solution: D

If we take three points A, B and C on a plane, then either we get a straight line or we get a triangle.



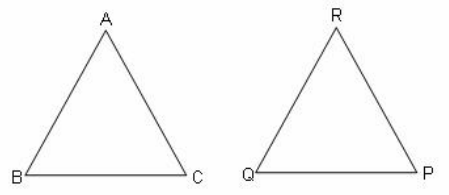
10. The one–to–one correspondence relation between $\triangle$ABC and $\triangle$PQR is expressed as ABC $\leftrightarrow$ RQP. The angle corresponding to $\angle$ABC is _____.

A. $\angle$QPR
B. $\angle$RQP
C. $\angle$QRP
D. $\angle$BCA

Solution: B

Right Answer Explanation:

The order of correspondence in $\triangle$ABC and $\triangle$PQR is given to be ABC $\leftrightarrow$ RQP.
Then, $\angle$ABC and $\angle$RQP are corresponding angles.



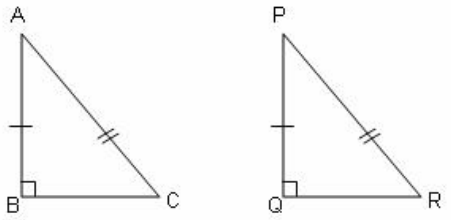
11. In the given figure, AB = PQ, AC = PR and $\angle$ABC = $\angle$PQR = 90^0. Which of the following congruency criteria would be preferred the most to prove $\triangle$ABC $\cong$ $\triangle$PQR?

A. RHS
B. SAS
C. ASA
D. SSS

Sol: A

Right Answer Explanation :

Because it follows RHS congruency condition



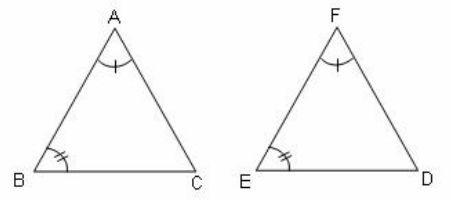
12. In $\triangle$ABC and $\triangle$DEF, $\angle$A = $\angle$F and $\angle$B = $\angle$E. Which of the following options represents the one–to–one correspondence between the two triangles?

A. ABC $\leftrightarrow$ DEF
B. ABC $\leftrightarrow$ FED
C. ABC $\leftrightarrow$ EFD
D. BAC $\leftrightarrow$ FED

Solution: B

Right Answer Explanation:

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



$\angle A \cong \angle F$

And $\angle B = \angle E$

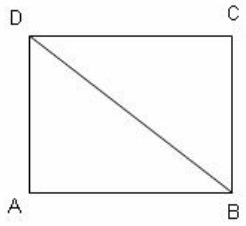
$\therefore$ A $\leftrightarrow$ F and B $\leftrightarrow$ E

$\therefore$ C $\leftrightarrow$ D

So, one–to–one correspondence is given by ABC $\leftrightarrow$ FED

13. In the given figure, ABCD is a quadrilateral such that $\angle A = \angle C = 90^0$. If AB = CD, which of the following congruency criteria would be preferred the most to prove that $\triangle ADB \cong \triangle CBD$?

A. SSS
B. SAS
C. RHS
D. SSA



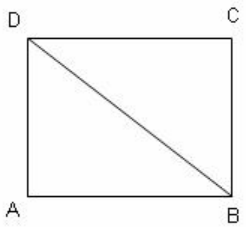
Solution: C

Right Answer Explanation:

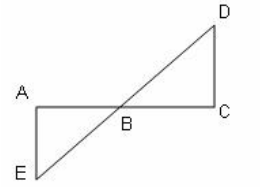
In $\triangle ADB$ and $\triangle CBD$,

$\angle A = \angle C$	[Each 90°]	[Right angle]
DB = BD	[Common]	[Hypotenuse]
AB = CD	[Given]	[Side]

$\Rightarrow \triangle ADB \cong \triangle CBD$ [By R.H.S rule]



14. In the given figure, AE $\perp$ AC and CD $\perp$ AC. Which of the following statements is always true about $\triangle$AEB and $\triangle$CDB?

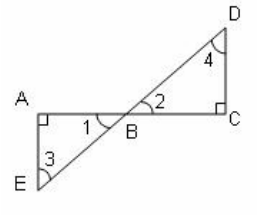


A. The triangles are congruent
B. The triangles are of the same shape
C. AE = CD
D. AB = BC

Solution: B

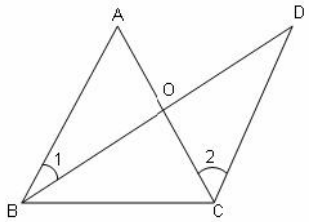
Right Answer Explanation:

From figure it shows the triangle ABE and CBD are of the same shape.



15. In the given figure, AC and BD intersect at O. If $\angle 1 = \angle 2$, then _____.

A. $\triangle$ABO and $\triangle$DCO have the same size
B. $\triangle$ABO and $\triangle$DCO have the same shape
C. $\triangle$ABO and $\triangle$DCO are congruent
D. $\angle 1 = \frac{1}{2}\angle ABC$



Solution: B

$\because$ $\angle 1 = \angle 2$ (Given)

$\angle AOB = \angle COD$ [Vertically opposite angles]

$\therefore$ $\angle A = \angle D$ [By angle sum property of triangles]

i.e. $\angle OAB = \angle ODC$

$\therefore$ $\triangle$ABO and $\triangle$DCO have the same shape as all the three angles of these two triangles are equal.

16. In $\triangle ABC$ and $\triangle DEF$, $\angle A = \angle D$ and $\angle B = \angle E$. Which of the following statements is always true?

A. Both the triangles will be of the same size.
B. Both the triangles will be of the same shape.
C. Both the triangles will be of the same shape and size.
D. Nothing can be said about the shape or size of the two triangles.

Solution: B

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

$\angle BAC = \angle EDF$ ..... (1)

$\angle B = \angle E$ .... (2)

Also, $\angle A + \angle B + \angle C = 180°$

$\angle D + \angle E + \angle F = 180°$[By angle sum property of triangle]

$\Rightarrow \angle A + \angle B + \angle C = \angle D + \angle E + \angle F$

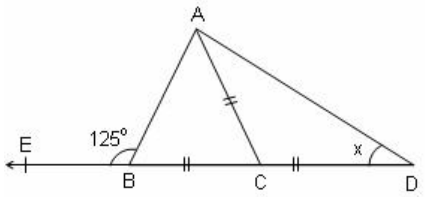
$\Rightarrow \angle C = \angle F$ [$\because \angle A = \angle D$ and $\angle B = \angle E$]

If all the three angles of two triangles are equal, then the triangles have the same shape.

17. In the given figure, congruent parts are marked with identical signs. Find the value of 'x'.

A. 55°
B. 25°
C. 35°
D. 70°

Solution: C



$\angle EBA + \angle ABC = 180°$[Linear pair]

$125° + \angle ABC = 180°$

$\angle ABC = 180° - 125°$

$\angle ABC = 55°$

Also, $\angle ABC = \angle CAB$ [$\because$ BC = AC, angles opposite to equal sides of a triangle are equal.]

$\Rightarrow \angle CAB = 55°$

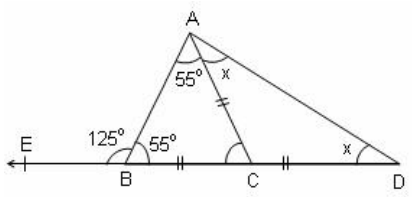
Now, in $\triangle ABC$

$\angle ABC + \angle CAB + \angle BCA = 180°$ [Angle sum property of a triangle]

$55° + 55° + \angle BCA = 180°$

$\angle BCA = 180° - 110°$

$\angle BCA = 70°$



$\angle BCA = \angle CAD + \angle CDA$ [Exterior angle property]

Also, $\angle CAD = x = \angle CDA$ [$\because$ AC = CD]

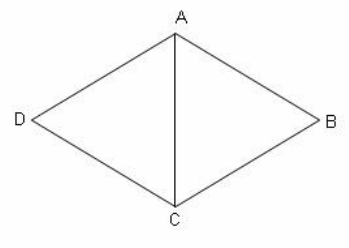
Then, $\angle BCA = x + x$

$= 2x$

So, $70° = 2x$

$x = 35°$

18. In the given figure, $\angle D = \angle B$. If CA bisects $\angle C$, which of the following relationships is true?



A. $\angle ACD = \angle EAC$
B. $\angle DAC = \angle EAC$
C. $\triangle ABC \cong \triangle CDA$
D. $\triangle ACD \cong \triangle ABC$

Solution: B

Right Answer Explanation:

In $\triangle ACD$ and $\triangle ACB$,

$\angle D = \angle B$ (given)

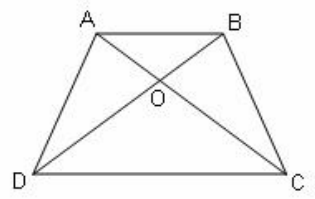
$\angle 1 = \angle 2$ ($\because$ AC bisects angle $\angle C$]

And $AC = AC$ [Common]

$\Rightarrow$ $\triangle ACD \cong \triangle ACB$ [By AAS rule]

$\Rightarrow$ $\angle DAC = \angle BAC$ [By c.p.c.t]

19. In the given figure, ABCD is a quadrilateral, AD = BC and BD = AC. Which of the following relationships is true?



A. $\angle ADC = \angle BDC$
B. $\triangle AOB \cong \triangle DOC$
C. $\triangle ADC \cong \triangle BDC$
D. $\triangle ACD \cong \triangle BDC$

Solution: D

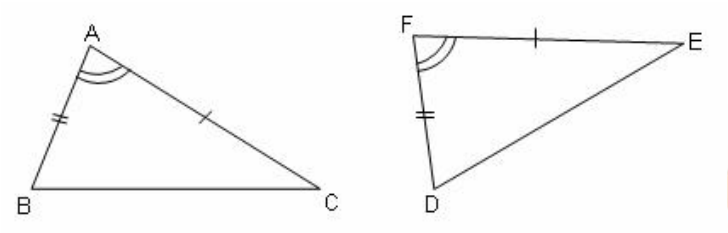
Right Answer Explanation:

In $\triangle ACD$ and $\triangle BDC$,

$AD = BC$ [given]

AC = BD [given]
CD = DC [common]
$\Rightarrow$ $\triangle ACD \cong \triangle BDC$ [By SSS rule]

20. In the given figure, the congruent parts in the two triangles are marked by identical signs. Which of the following options represents one–to–one correspondence between the two triangles?



A. ACB $\leftrightarrow$ EDF
B. ABC $\leftrightarrow$ DEF
C. BAC $\leftrightarrow$ DFE
D. CAB $\leftrightarrow$ FED

Solution: C

Right Answer Explanation:

In $\triangle ABC$ and $\triangle FDE$,
AB = FD [given]
$\angle A = \angle F$ [given]
AC = FE [given]
$\therefore$ $\triangle ABC \cong \triangle FDE$
$\Rightarrow$ A $\leftrightarrow$ F, B $\leftrightarrow$ D and C $\leftrightarrow$ E
$\Rightarrow$ BAC $\leftrightarrow$ DFE is correct correspondence.