



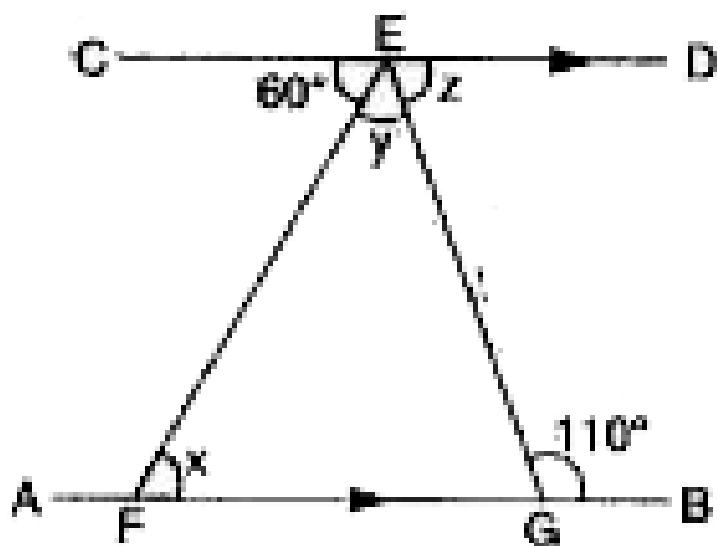
MATHS

BOOKS - S CHAND IIT JEE FOUNDATION

TRIANGLES

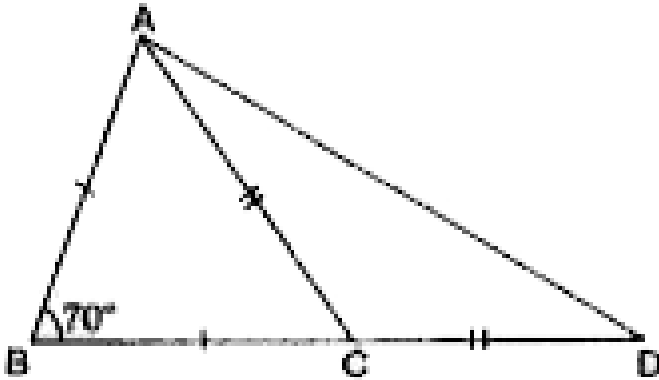
Solved Examples

1. If AB is parallel to CD as given in the figure, then find the values of $\angle x$, $\angle y$ and $\angle z$.



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2. In the following figure, find $\angle ADC$.



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3. In $\triangle ABC$, M is the mid point of BC . Length of AM is 9, N is a point on AM such that $MN = 1$. What is the distance of N from the centroid of the triangle?

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4. In a $\triangle ABC$, if the bisector of the angle BAC meets BC in D , then which one of the following is correct?

A. $AB \leq BD$

B. $\angle DBA > \frac{1}{2}\angle BAC$

C. $\triangle ABD$ can never be isosceles

D. If $BD = AD$, then $\triangle ABD$ will be equilateral.

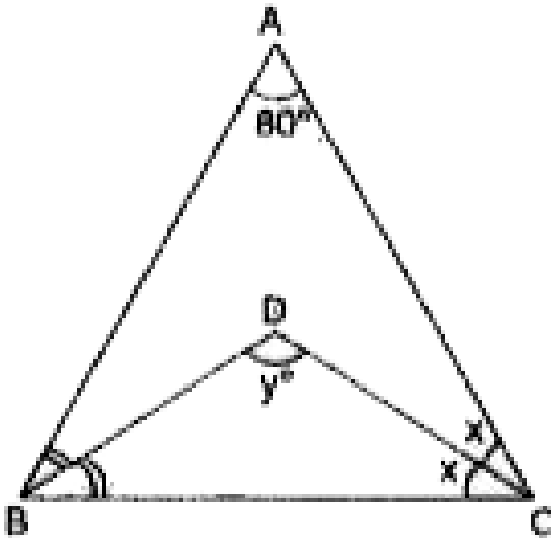
Answer: b

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5. P and Q are the mid point of the sides CA and CB respectively of a triangle ABC , right angled at C . then, find the value of $4(AQ^2 + BP^2)$.

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1. In the given figure, $\angle A = 80^\circ$, $\angle B = 60^\circ$, $\angle C = 2x^\circ$ and $\angle BDC = y^\circ$. BD and CD bisect angles B and C respectively.



The values of x and y respectively are :

- A. 15° and 70°
- B. 10° and 160°

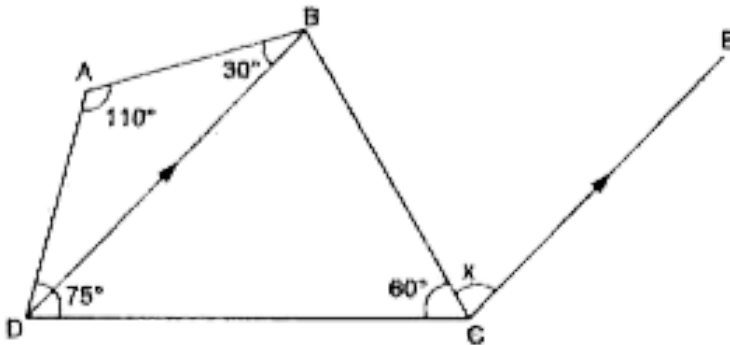
C. 20° and 130°

D. 20° and 125°

Answer: C

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2. If CE is parallel to DB in the given figure, then the value of x will be



A. 45°

B. 75°

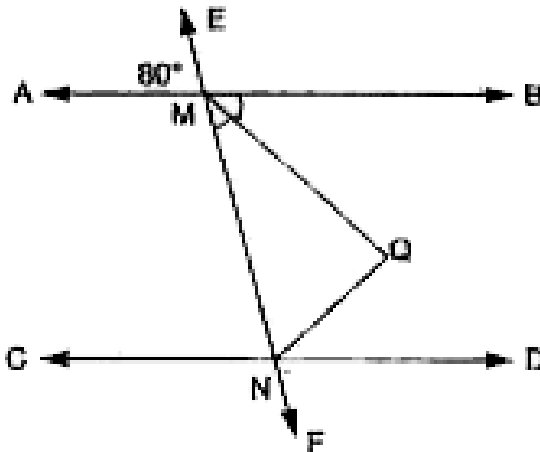
C. 30°

D. 85°

Answer: D

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3. If CD is parallel to AB in the given figure, then the value of x
 $\angle MQN$ will be



A. 60°

B. 70°

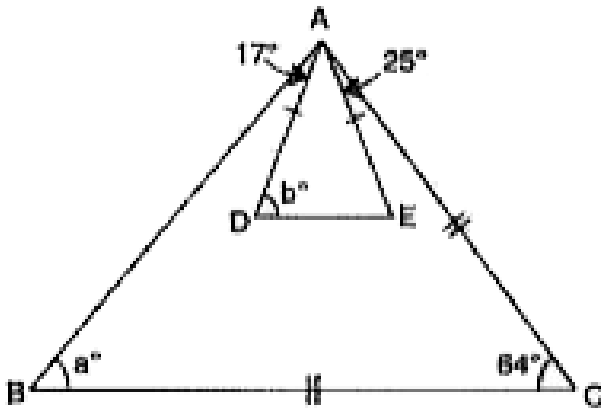
C. 80°

D. 90°

Answer: D

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4. The diagram shows 2 isosceles triangles. What is the sum of a and b.



A. 79°

B. 58°

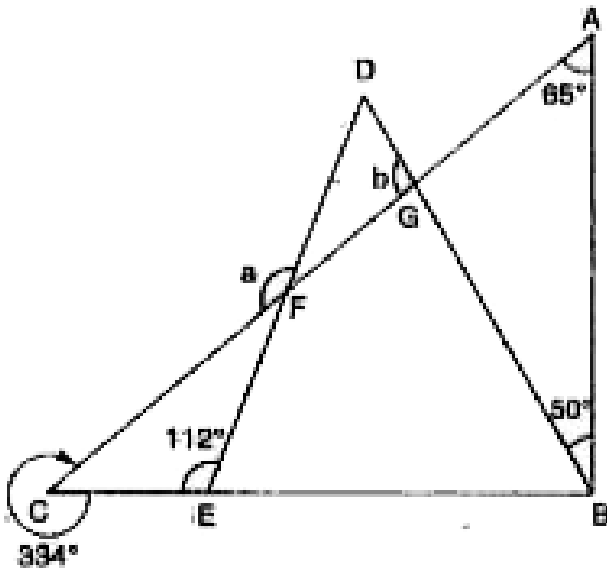
C. 137°

D. 116°

Answer: C

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5. The given figure shows two overlapping triangles. The value of $a - b$ is



A. 65°

B. 138°

C. 73°

D. 48°

Answer: C



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6. D, E, F are the mid points of BC, CA and AB of $\triangle ABC$. If AD and BE intersect in G , then $AG + BG + CG$ is equal to

A. $AD = BE = CF$

B. $\frac{2}{3}(AD + BE + CF)$

C. $\frac{3}{2}(AD + BE + CF)$

D. $\frac{1}{3}(AD + BE + CF)$

Answer: B



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7. Consider the following statements relating to the congruency of two right triangles.

(1) Equality of two sides of one triangle with any two sides of the second makes the triangle congruent.

(2) Equality of the hypotenuse and a side of one triangle with the hypotenuse and a side of the second respectively makes the triangle congruent.

(3) Equality of the hypotenuse and an acute angle of one triangle with the hypotenuse and an angle of the second respectively makes the triangle congruent.

Of these statements :

A. 1, 2 and 3 are correct

B. 1 and 2 are correct

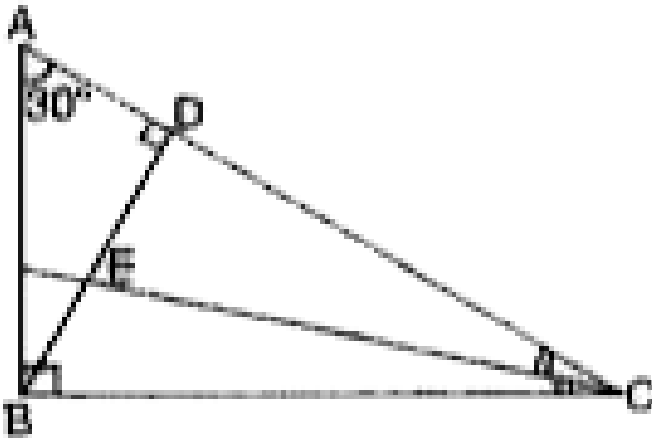
C. 1 and 3 are correct

D. 2 and 3 are correct

Answer: D

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8. $AB \perp BC$, $BD \perp AC$ and CE bisects $\angle C$. $\angle A = 30^\circ$. Then what is $\angle CED$?



A. 30°

B. 60°

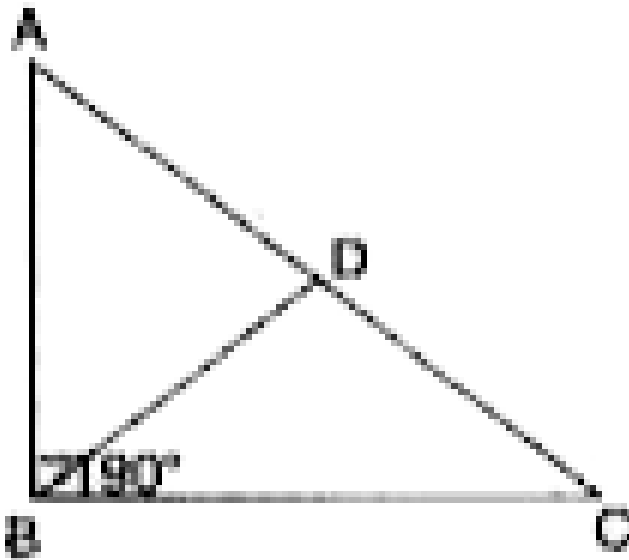
C. 45°

D. 65°

Answer: B

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9. In $\triangle ABC$, $\angle B$ is a right angle, $AC = 6$ cm, D is the mid point of AC . The length of BD is



A. 4 cm

B. $\sqrt{6}$ cm

C. 3 cm

D. 3.5 cm

Answer: C

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10. If the sides of a right triangle are x , $x + 1$ and $x - 1$, then the hypotenuse is

A. 5

B. 4

C. 1

D. 0

Answer: A



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11. The degree measure of each of the three angles of a triangle is an integer. Which of the following could NOT be the ratio of their measures ?

A. 2 : 3 : 4

B. 3 : 4 : 5

C. 5 : 6 : 7

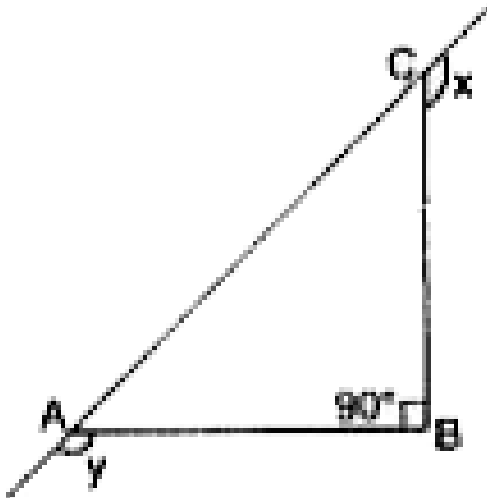
D. 6 : 7 : 8

Answer: D



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12. In a $\triangle ABC$ right angled at B, which statement is true?



- A. $x + y = 180^\circ$
- B. $x + y = 270^\circ$
- C. $x + y = 300^\circ$
- D. $x + y = 90^\circ$

Answer: B



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13. If PL , QM and RN are the altitudes of $\triangle PQR$ whose orthocentre is O , then P is the orthocentre of:

A. $\triangle PQO$

B. $\triangle PQL$

C. $\triangle QLO$

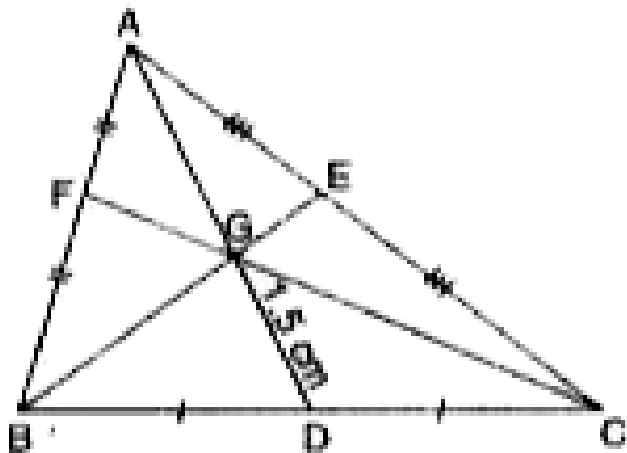
D. $\triangle QRO$

Answer: D

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14. In $\triangle ABC$ medians BE and CF intersect at G . If the straight line AGD meets BC in D in such a way that $GD = 1.5$ cm, then the length of

AD is :



A. 2.5 cm

B. 3 cm

C. 4 cm

D. 4.5 cm

Answer: D

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15. If the angles of a triangle are in the ratio 1:2:3, find the ratio between corresponding sides :

A. 1:2:3

B. 1:1: $\sqrt{2}$

C. 1: $\sqrt{3}$:3

D. 1: $\sqrt{2}$:2

Answer: A

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16. If the angles of a triangle are in the ratio 5:3:2, then the triangle could be

A. obtuse

B. acute

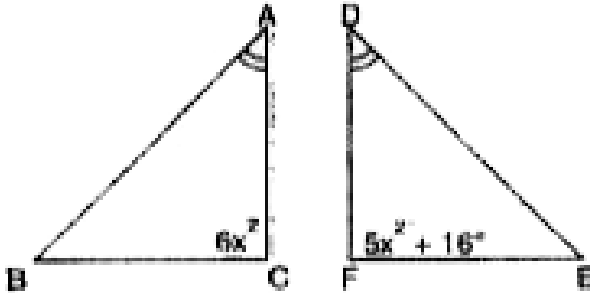
C. right

D. isosceles

Answer: C

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17. $\triangle ACB \cong \triangle DFE$. Find $\angle F$



A. 4°

B. 96°

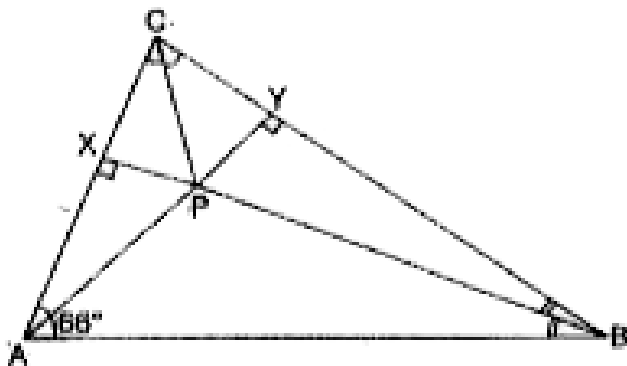
C. 100°

D. 60°

Answer: B

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18. P is the incentre of $\triangle ABC$. If $\angle CAB = 66^\circ$, and $\angle CPY = 46^\circ$, find $\angle PBA$?



- A. 16°
- B. 23°
- C. 13°
- D. 18°

Answer: C



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19. A man goes to a garden and runs in the following manner: From the starting point, he goes west 25 m, then due north 60 m, then due east 80 m and finally due south 12 m. The distance between the finishing point and the starting point is :

A. 177 m

B. 103 m

C. 83 m

D. 73 m

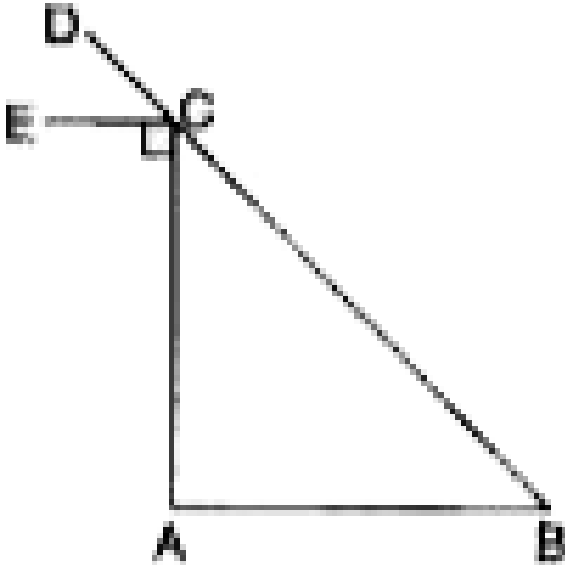
Answer: D



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20. In the given figure, ABC is a triangle in which BC is produced to D.

If $\angle A : \angle B : \angle C :: 3 : 2 : 1$ and $AC \perp CE$, then $\angle ECD$ is :



A. 30°

B. 45°

C. 60°

D. 72°

Answer: C



21. If ABCD is a square, X is the mid point of AB and Y is the mid point of BC, then which of the following is NOT correct?

A. The triangles ADX and BAY are congruent

B. $\angle DXA = \angle AYB$

C. $\angle ADX = \angle BAY$

D. DX is not perpendicular to AY

Answer: D

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22. In a $\triangle PQR$, the sides PQ and PR are produced to S and T respectively. Bisectors of $\angle SQR$ and $\angle QRT$ meet at the point O. If $\angle P = 66^\circ$, then what is the value of $\angle QOR$?

A. 47°

B. 50°

C. 57°

D. 67°

Answer: C



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23. In a $\triangle ABC$, $\angle C = 110^\circ$. Which one of the following statements is correct ?

A. $AB^2 > AC^2 + BC^2$

B. $AB^2 < AC^2 + BC^2$

C. $AC^2 > AB^2 + BC^2$

D. $BC^2 > AB^2 + AC^2$

Answer: A



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24. In which one of the following triangles does the orthocentre lie in the exterior of the triangle.

A. $\triangle ABC$, where in, $\angle A = \angle B = \angle C = 60^\circ$

B. $\triangle PQR$, wherein, $\angle P = 40^\circ$, $\angle Q = 30^\circ$, $\angle R = 110^\circ$

C. $\triangle XYZ$, wherein, $\angle X = 80^\circ$, $\angle Y = 60^\circ$, $\angle Z = 40^\circ$

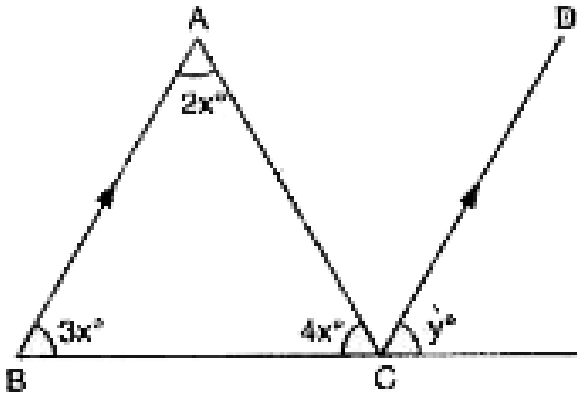
D. $\triangle DEF$, wherein, $\angle D = 52^\circ$, $\angle E = 90^\circ$, $\angle F = 38^\circ$

Answer: B



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1. In the figure CD is parallel to AB. The angle y is equal to:



- A. 40°
- B. 60°
- C. 80°
- D. 100°

Answer: B

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2. The side opposite to an obtuse angle of a triangle is :

- A. smallest
- B. greatest
- C. half of the perimeter
- D. none of these

Answer: B



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3. The point of intersection of the right bisectors of a triangle is called

- A. in-centre
- B. circumcentre
- C. orthocentre

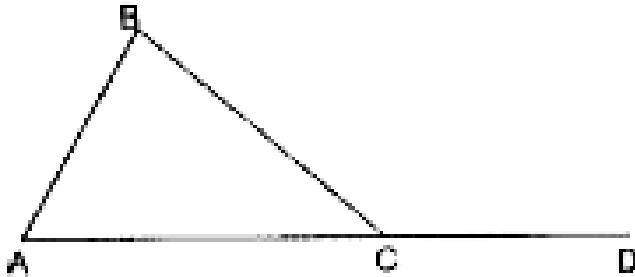
D. centroid

Answer: B

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4. $\angle A$ and $\angle B$ are the interior opposite angle of $\angle BCD$ in $\triangle ABC$.

Which of these statements is true?



A. $\angle BCA = \angle BCD - \angle A$

B. $\angle A - 180^\circ = \angle B$

C. $\angle A = 90^\circ - \angle B$

D. $\angle B = \angle BCD - \angle A$

Answer: D



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5.

Ankita wants to prove $\triangle ABC \cong \triangle DEF$ using *SAS*. She knows

$AB = DE$ and $AC = DF$

.What additional piece of information does she need ?

A. $\angle A = \angle D$

B. $\angle C = \angle F$

C. $\angle B = \angle E$

D. $\angle A = \angle B$

Answer: A



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6. In a $\triangle ABC$, the sum of exterior angles at B and C is equal to:

A. $180^\circ - \angle BAC$

B. $180^\circ + \angle BAC$

C. $180^\circ - 2\angle BAC$

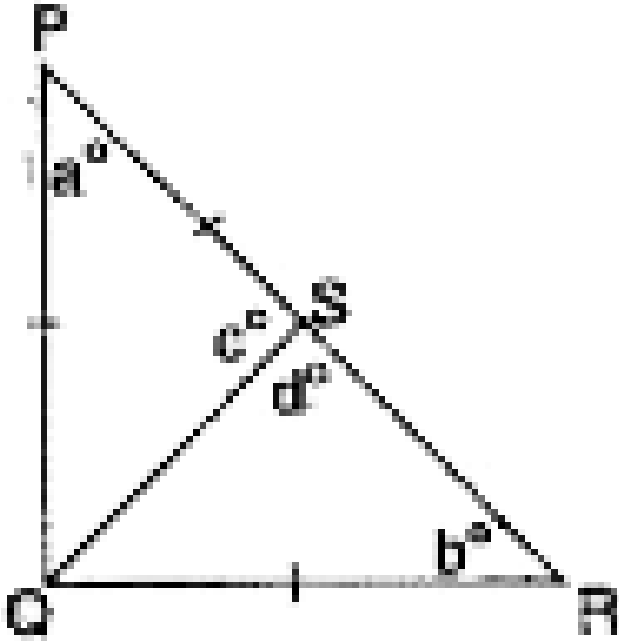
D. $180^\circ + 2\angle BAC$

Answer: B



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7. $PQ = QR = PS$. Calculate the size of the labelled angles.



A. $a = 40^\circ, b = 50^\circ, c = 70^\circ, d = 110^\circ$

B. $a = 42^\circ, b = 48^\circ, c = 69^\circ, d = 111^\circ$

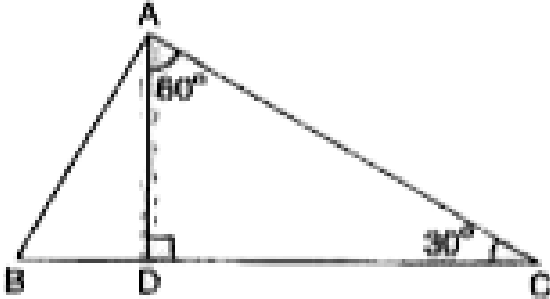
C. $a = 45^\circ, b = 45^\circ, c = 67.5^\circ, d = 112.5^\circ$

D. $a = 50^\circ, b = 40^\circ, c = 65^\circ, d = 115^\circ$

Answer: C

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8. Which of the following is not a correct statement.



A. $AC = 2AD$

B. $\angle ACD = \angle CAB + \angle ABC$

C. $BD^2 = AB^2 - AD^2$

D. $AC > AB + BC$

Answer: B,D

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9. If the straight line which bisects the vertical angle of a triangle is perpendicular to the base, the triangle is:

- A. equilateral
- B. isosceles
- C. scalene
- D. right- angled

Answer: B

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10. Match correctly

- | | |
|---|--|
| (1) Each angle of an equilateral Δ | (a) greater than $2\text{rt. } \angle\text{s}$ |
| (2) Measure of the vertical angle of a Δ if each base angle is double the vertical angle | (b) incentre |
| (3) Sum of any two exterior angles of a Δ | (c) 36° |
| (4) Point of intersection of the angle bisectors of a Δ | (d) 60° |

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