

TB(3A) Ch. 3 Special Lines & Centres in a Triangle

Multiple Choice Questions

1. [14-15 Mid-year Exam Q7]

Each of the following cases lists the lengths of 3 line segments. Which of them cannot form a triangle?

- A. 8, 1, 7 B. 9, 5, 8
 C. 10, 6, 8 D. 11, 11, 6

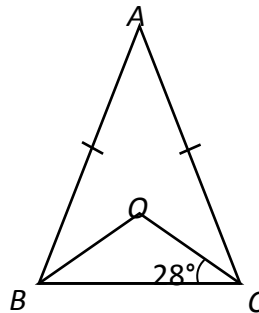
2. [14-15 Mid-year Exam Q8]

ABC is an isosceles triangle where

$AB = AC$. O is the incentre of $\triangle ABC$ and $\angle BCO = 28^\circ$. Which of the following must be true?

- I. $OB = OC$
 II. $\angle ABC = 56^\circ$
 III. $\angle BAC = 68^\circ$

- A. I and II only
 B. I and III only
 C. II and III only
 D. All of the above



3. [14-15 Mid-year Exam Q16]

Consider an equilateral triangle ABC . Which of the following lines coincide?

- I. Angle bisector of $\angle BAC$
 II. Median of $\triangle ABC$ from A
 III. Perpendicular bisector of BC

- A. I and II only
 B. I and III only
 C. II and III only
 D. All of the above

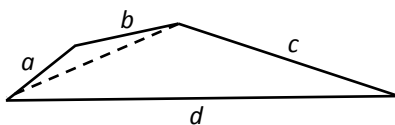
4. [14-15 Final Exam Q6]

In $\triangle ABC$, $\angle C = 90^\circ$. Which of the following centres lies on AB ?

- A. Incentre B. Centroid
 C. Orthocentre D. Circumcentre

5. [14-15 Final Exam Q29]

The figure shows a quadrilateral. Which of the following is a possible set of values of a , b , c and d ?



- A. $a = 1, b = 2, c = 3, d = 4$
 B. $a = 1, b = 2, c = 4, d = 8$
 C. $a = 1, b = 3, c = 6, d = 10$

D. $a = 1, b = 4, c = 9, d = 16$

6. [15-16 Mid-year Q3]

Which of the following sets of line segments can form a triangle?

- A. 3 cm, 5 cm, 8 cm
- B. 4.1 cm, 4.2 cm, 10 cm
- C. 0.1 cm, 0.2 cm, $\sqrt{0.15}$ cm
- D. $\sqrt{2}$ cm, $\sqrt{3}$ cm, $\sqrt{5}$ cm

7. [15-16 Mid-year Q4]

If $\triangle ABC$ is an obtuse-angled triangle, which of the following points lie inside $\triangle ABC$?

- I. The centroid of $\triangle ABC$
 - II. The incentre of $\triangle ABC$
 - III. The orthocentre of $\triangle ABC$
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

8. [15-16 Mid-year Q18]

$\triangle OBC$ is an isosceles triangle where

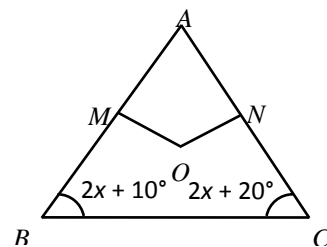
$OB = OC$. O is the orthocentre of $\triangle ABC$ and $\angle BCO = 28^\circ$. Which of the following must be true?

- I. $\angle BAC = 56^\circ$
 - II. $\triangle ABC$ is isosceles.
 - III. Incentre of $\triangle ABC$ lies on AO .
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

9. [15-16 Mid-year Q19]

In $\triangle ABC$, M and N are mid-points of AB and AC respectively. O is the circumcentre of $\triangle ABC$, $\angle ABC = 2x + 10^\circ$ and $\angle ACB = 2x + 20^\circ$. Find $\angle MON$.

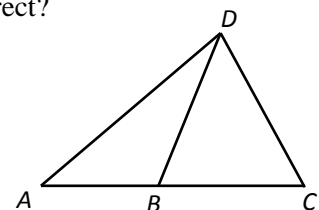
- A. $2x + 10^\circ$.
- B. $2x + 15^\circ$.
- C. $4x + 30^\circ$.
- D. $4x + 60^\circ$.



10. [15-16 Final Exam Q7]

In the figure, B is a point on AC . Which of the following may not be correct?

- A. $AB + BD > AD$
- B. $BC + CD > BD$
- C. $AD + CD > AB$



D. $BD + CD > AB$

11. [15-16 Final Exam Q30]

If G is the centre of $\triangle ABC$ which lies outside the triangle, which of the following must be wrong?

- I. G is a centroid.
- II. G is an orthocentre.
- III. $\angle B < 90^\circ$.

- A. I only
- B. II only
- C. I and II only
- D. I and III only

12. [16-17 Mid-year Exam Q4]

Which of the following cannot be the lengths of the three sides of a triangle?

- A. 4 cm, 6 cm, 8 cm
- B. 3.1 cm, 3.2 cm, 3.3 cm
- C. 7 cm, 7 cm, 7 cm
- D. 3 cm, 4 cm, 7 cm

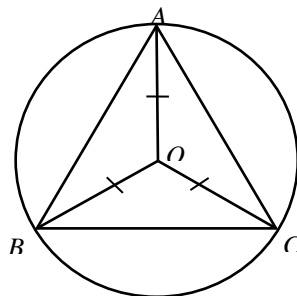
13. [16-17 Mid-year Exam Q7]

Which of the following centres lie inside an obtuse-angled triangle?

- I. Incentre
 - II. Centroid
 - III. Circumcentre
 - IV. Orthocentre
- A. I and II only
 - B. I and III only
 - C. II and IV only
 - D. III and IV only

14. [16-17 Mid-year Exam Q8]

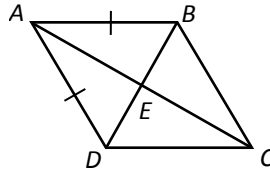
In the figure, $OA = OB = OC$ and A, B and C lie on the same circle with O as the centre. What is the name of centre O ?



- A. Incentre
- B. Centroid
- C. Circumcentre
- D. Orthocentre

15. [16-17 Mid-year Exam Q19]

In the figure, $ABCD$ is a quadrilateral. AEC and BED are straight lines. It is given that $AB = AD$ and BE is an angle bisector of $\triangle ABC$. Which of the following must be true?



- I. $AB \parallel DC$
- II. $AD \parallel BC$
- III. BD is an angle bisector of $\triangle ACD$.

- A. II only
- B. I and II only
- C. II and III only
- D. I, II and III

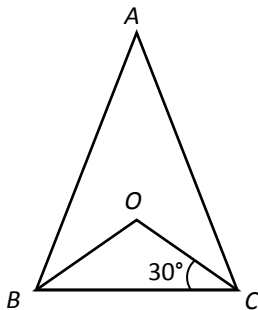
16. [16-17 Final Exam Q5]

Which of the following sets of line segments cannot form a triangle?

- A. 1 cm, 3 cm, 5 cm
- B. 3 cm, 4 cm, 5 cm
- C. 7 cm, 7 cm, 7 cm
- D. $\sqrt{2}$ cm, $\sqrt{2}$ cm, 2 cm

17. [16-17 Final Exam Q23]

In the figure, OBC is an isosceles triangle where $OB = OC$. OB and OC bisect $\angle ABC$ and $\angle ACB$ respectively, and $\angle BCO = 30^\circ$. Which of the following must be true?

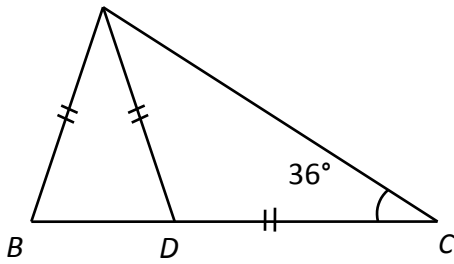


- I. $\triangle ABC$ is an equilateral triangle.
- II. Angle bisector of $\angle BAC$ passes through O .
- III. Perpendicular bisector of BC coincides with median of $\triangle ABC$ from A .

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

18. [17-18 Mid-year Exam Q7]

In the figure, $AB = AD = CD$ and BDC is a straight line. Which of the following centres of $\triangle ABC$ lies on AD ?



- A. In-centre
- B. Circumcentre
- C. Centroid
- D. Orthocentre

19. [17-18 Mid-year Exam Q15]

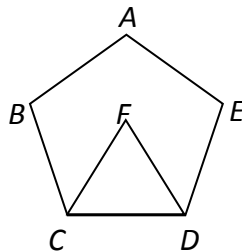
I is the in-centre of $\triangle ABC$. If $\angle ABC = 50^\circ$ and $\angle BCA = 100^\circ$, then $\angle BIC =$

- A. 70° .
- B. 75° .
- C. 105° .
- D. 115° .

20. [17-18 Mid-year Exam Q17]

In the figure, $ABCDE$ is a regular pentagon. $\triangle CFD$ is an equilateral triangle. Which of the following are true?

- I. $CF^2 + FD^2 > CD^2$
- II. $BC + ED > BE$
- III. $BC + DF > BF$



- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

21. [17-18 Mid-year Exam Q19]

In $\triangle ABC$, $\angle A = 90^\circ$ and D is the mid-point of BC . Which of the following must be true?

- I. A is the orthocentre of $\triangle ABC$.
 - II. D is the circumcentre of $\triangle ABC$.
 - III. $\triangle ACD$ is an isosceles triangle.
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

22. [18-19 Mid-year Exam Q5]

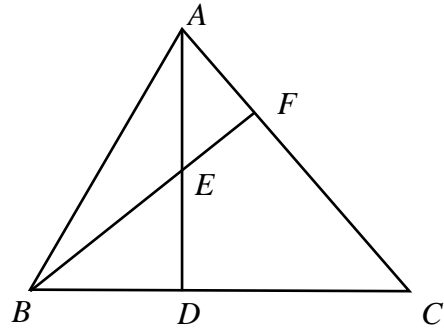
Which of the following sets of line segments **CANNOT** form a triangle?

- A. 7 cm, 7 cm, 7 cm
- B. 2 cm, 3 cm, 4 cm
- C. $\sqrt{5}$ cm, $\sqrt{6}$ cm, $\sqrt{17}$ cm
- D. 3 cm, 4 cm, 7 cm

23. [18-19 Mid-year Exam Q6]

In the figure, which of the following must be true?

- A. $AF + EF > AD$
- B. $AB + BD < AE$
- C. $AE + EF > AF$
- D. $AC + CD < AE$



24. [18-19 Mid-year Exam Q10]

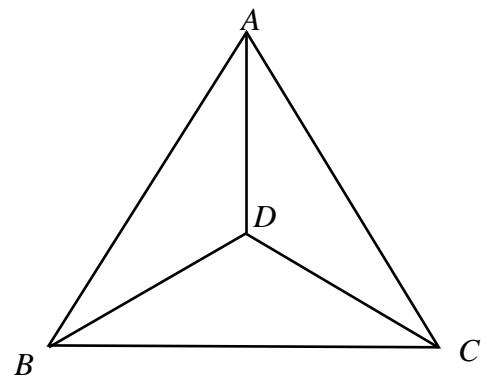
Which of the following centres of an obtuse-angled triangle must lie outside the triangle?

- I. Centroid
 - II. Orthocentre
 - III. Incentre
 - IV. Circumcentre
- A. I and IV only
 - B. II and III only
 - C. II and IV only
 - D. II, III and IV only

25. [18-19 Mid-year Exam Q18]

In the figure, $\triangle BCD$ is an isosceles triangle where $BD = CD$, DC is the angle bisector of $\angle ACB$ and DB is the angle bisector of $\angle ABC$. Which of the following must be true?

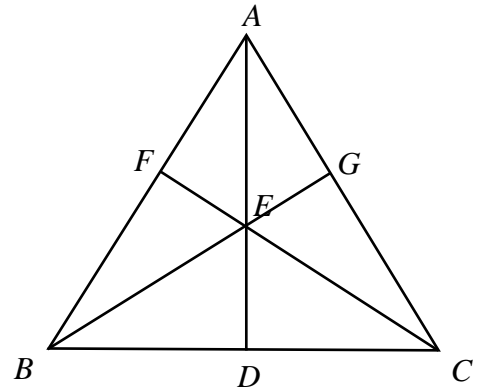
- I. $\angle BAD = \angle CAD$
 - II. $\angle ADB = 120^\circ$
 - III. $\triangle ABC$ is an equilateral triangle.
- A. I only
 - B. I and II only
 - C. II and III only
 - D. I, II and III



26. [18-19 Mid-year Exam Q19]

In the figure, AD , CF and BG are the medians of $\triangle ABC$ and they intersect at E . It is given that $AC : BC : AB = 5 : 8 : 5$, $AD \perp BC$ and the perimeter of $\triangle ABC$ is 36 cm. Find AE .

- A. 3 cm
- B. 4 cm
- C. 6 cm
- D. 8 cm

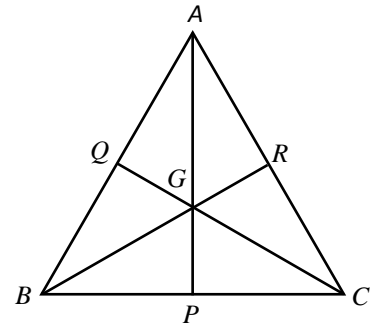


27. [18-19 Final Exam Q18]

In the figure, $\triangle ABC$ is an equilateral triangle. AP , BQ and CR are medians of $\triangle ABC$. Which of the following statement(s) is/are true?

- I. AP is an altitude of $\triangle ABC$.
- II. BQ is the angle bisector of $\angle ABC$.
- III. CR is the perpendicular bisector of AB .

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III



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