TB(3A) Ch. 4 Special Lines and Centres in a Triangle
Multiple Choice Questions

1. **[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
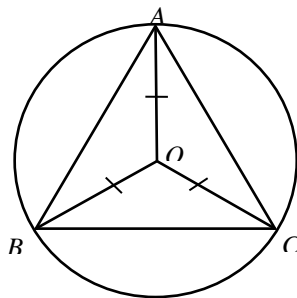   D.   3 cm, 4 cm, 7 cm

2. **[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

3. **[16-17 Mid-year Exam Q8]**
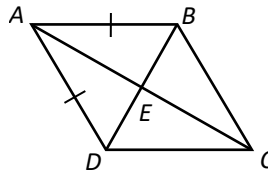   In the figure, $OA = OB = OC$ and A, B and C lie on the same circle with O as the centre. What is the name of centre O?

    A. Incentre

    B. Centroid

    C. Circumcentre

    D. Orthocentre

4. **[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 Δ*ABC*. Which of the following must be true?

   I.   *AB // DC*
   II. *AD // BC*
   III. *BD* is an angle bisector of Δ*ACD*.

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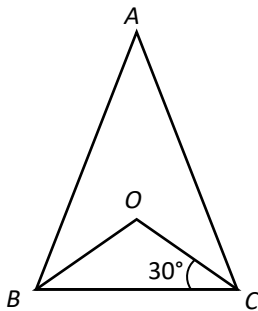   C. II and III only
   D. I, II and III

5. **[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

6. **[16-17 Final Exam Q23]**
    In the figure, *OBC* is an isosceles triangle where *OB = OC*. *OB* and *OC* bisect ∠*ABC* and ∠*ACB* respectively, and ∠*BCO* = 30°. Which of the following must be true?
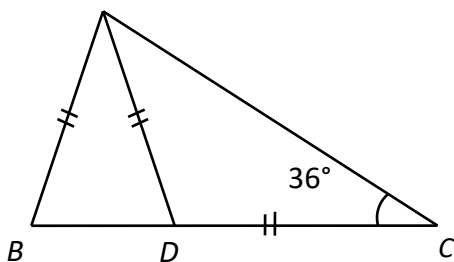

   I.   Δ*ABC* is an equilateral triangle.
   II.   Angle bisector of ∠*BAC* passes through *O*.
   III. Perpendicular bisector of *BC* coincides with median of Δ*ABC* from *A*.

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

7. **[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
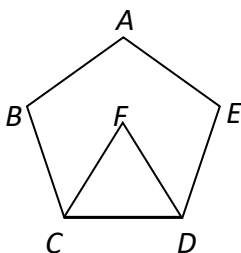   C. Centroid
   D. Orthocentre

8. **[17-18 Mid-year Exam Q15]**
   I is the in-centre of $\triangle ABC$. If $\angle ABC = 50°$ and $\angle BCA = 100°$, then $\angle BIC =$

   A. $70°$.

   B. $75°$.

   C. $105°$.

   D. $115°$.

9. **[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

10. **[17-18 Mid-year Exam Q19]**

In $\triangle ABC$, $\angle A = 90°$ 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
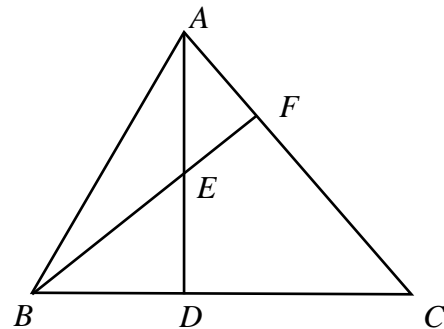D. I, II and III

11. **[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

12. **[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. $AC + CD < AE$

13. **[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

14. **[18-19 Mid-year Exam Q18]**

In the figure, ΔBCD 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?
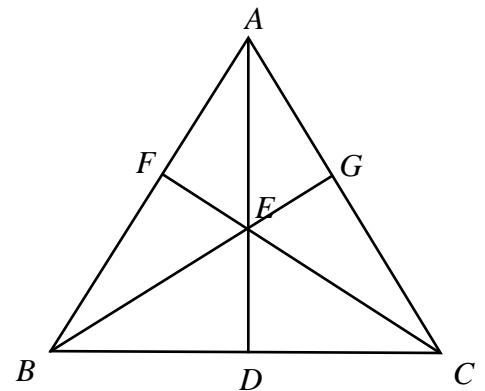
    I. $\angle BAD = \angle CAD$
    II. $\angle ADB = 120°$
    III. ΔABC is an equilateral triangle.

  A. I only
  B. I and II only
  C. II and III only
  D. I, II and III
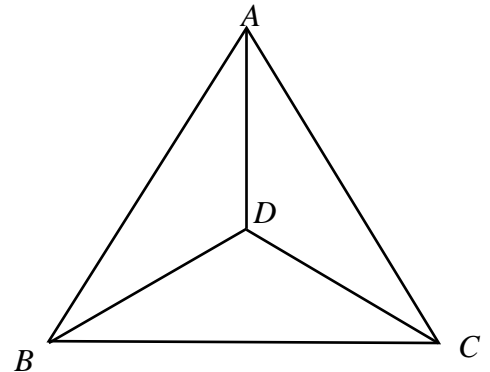
15. **[18-19 Mid-year Exam Q19]**

In the figure, *AD, CF* and *BG* are the medians of ΔABC and they intersect at *E*. It is given that $AC:BC:AB = 5:8:5$, $AD \perp BC$ and the perimeter of ΔABC is 36 cm. Find *AE*.
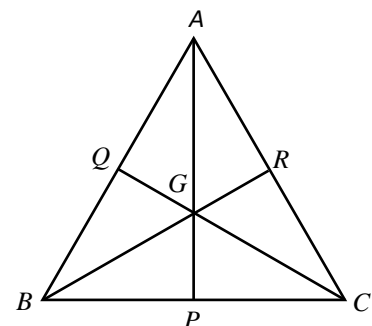
  A. 3 cm

  B. 4 cm

  C. 6 cm

  D. 8 cm

16. **[18-19 Final Exam Q18]**

In the figure, ΔABC is an equilateral triangle. *AP*, *BR* and *CQ* are medians of ΔABC. Which of the following statement(s) is/are true?

    I.   *AP* is an attitude of ΔABC.

    II. *BR* is the angle bisector of $\angle ABC$.

    III. *CQ* is the perpendicular bisector of *AB*.

  A. I and II only

  B. I and III only

  C. II and III only
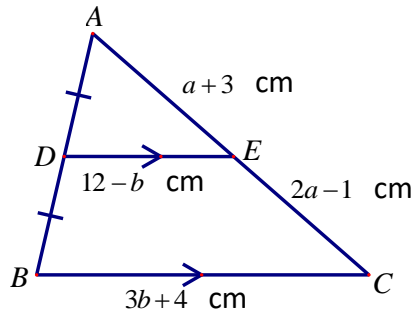
  D. I, II and III

17. [19-20 Mid year, Q7]
Which of the following sets of lengths of line segments can form a triangle?

- **A.** 1, 2, 3
- **B.** 2, 4, 8
- **C.** 11, 22, 33
- **D.** 12, 23, 34

18. [19-20 Mid year, Q10]
In the figure, $AD = DB$ and $DE \mathbin{/\!/} BC$. Find the values of a and b.

- **A.** $a = 4$, $b = 4$
- **B.** $a = 4$, $b = 2$
- **C.** $a = 2$, $b = 4$
- **D.** $a = 2$, $b = 2$

19. [19-20 Mid year, Q11]
$\triangle ABC$ is a right-angled triangle where $\angle ABC = 90°$. Which of the following must be true?

- I.   The centroid of $\triangle ABC$ lies inside the triangle.
- II.   The circumcentre of $\triangle ABC$ lies on AB.
- III. B is the orthocentre of $\triangle ABC$.

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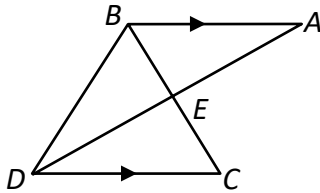- **C.** II and III only
- **D.** I, II and III only

20. [19-20 Mid year, Q19]
I is the incentre of $\triangle ABC$. If $\angle AIB = 124°$, then $\angle ACB =$

- **A.** $28°$.
- **B.** $34°$.
- **C.** $56°$.
- **D.** $68°$.

21. **[20-21 Mid-year, #4]**

    In the figure, *AD* and *BC* intersect at *E*. *AD* is the angle bisector of ∠*BDC* and   *AB // CD*. Which of the following must be true?

    A. *BC* is the angle bisector of ∠*ABD*.
    B. *DE* is a median of Δ*BCD*.
    C. Δ*ABD* is an isosceles triangle.
    D. *BE* is the perpendicular bisector of AD.

22. **[20-21 Mid-year, #8]**

    The lengths of three line segments are 6 cm, x cm and $(2x - 3)$ cm, where x is an integer. How many different triangles can be formed by these line segments?

    A. 4
    B. 5
    C. 6
    D. 7

23. **[20-21 Final Exam, #4]**

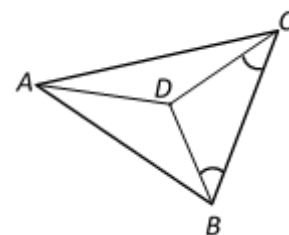   Which of the following sets of line segments **CANNOT** form a triangle?

    I.   15, 9, 5
    II. 35, 18, 18
    III. 25, 13, 12

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

24. **[20-21 Final Exam, #23]**

    In the figure, *D* is the centroid of Δ*ABC*. If ∠*DBC* = ∠*DCB*, which of the following must be true?

    I.   ∠*BAD* = ∠*CAD*.
    II. Δ*ABC* is an equilateral triangle.
    III. *D* is also the in-centre of Δ*ABC*.

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

~ End ~