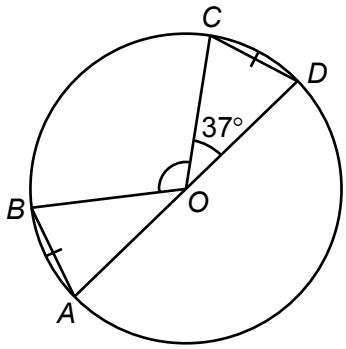
F.4 Mathematics

MC Exercise

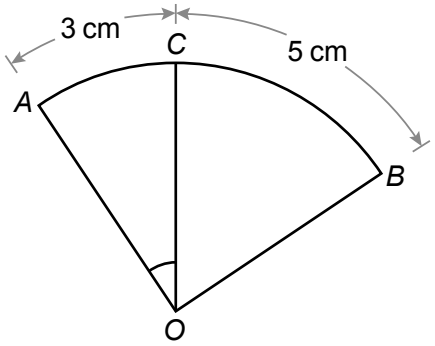
4B11 Properties of Circles

1. In the figure, O is the centre of the circle and AOD is a straight line. AB and CD are equal chords. If $\angle COD = 37°$, then $\angle BOC =$



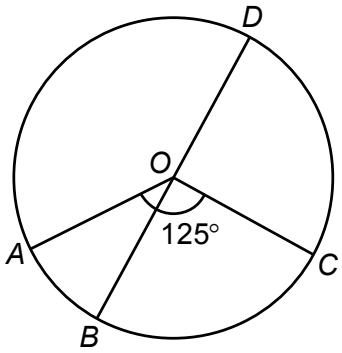
A. 74°.
B. 106°.
C. 127°.
D. 254°.

2. The figure shows a quadrant of a circle with centre O. If $\overset{\frown}{AC} = 3$ cm and $\overset{\frown}{CB} = 5$ cm, find $\angle AOC$.



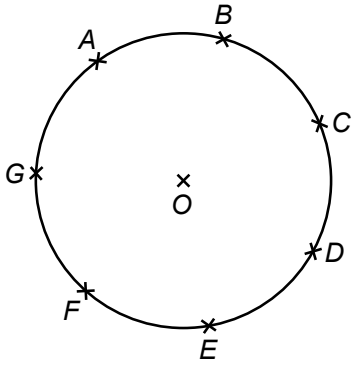
A. 33.75°
B. 35°
C. 40°
D. 42°

3. In the figure, O is the centre of the circle and BOD is a straight line. $\angle AOC = 125°$. If $\overset{\frown}{AB} : \overset{\frown}{BC} = 7:18$, then $\overset{\frown}{AD} : \overset{\frown}{DC} =$



A. 18 : 7.
B. 18 : 11.
C. 25 : 18.
D. 29 : 18.

4. In the figure, O is the centre of the circle. A, B, C, D, E, F and G are points lying on the circle. It is given that $\overset{\frown}{AB} = \overset{\frown}{BC} = \overset{\frown}{CD} = \overset{\frown}{DE} = \overset{\frown}{EF} = \overset{\frown}{FG} = \overset{\frown}{GA}$.



Which of the following must be true?

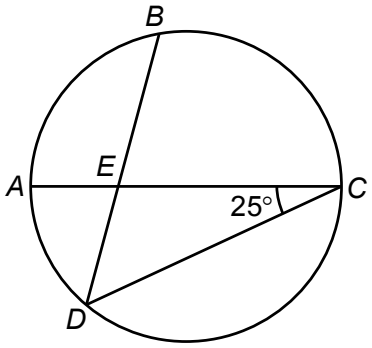
I. $\angle AOB = \dfrac{360°}{7}$

II. $ABCDEFG$ is a regular heptagon.

III. $\Delta AOC \cong \Delta BOD$

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

5. In the figure, AC is a diameter of the circle. BD and CD are equal chords. AC and BD intersect at E. If $\angle ACD = 25°$, then $\overset{\frown}{AB} : \overset{\frown}{BD} =$



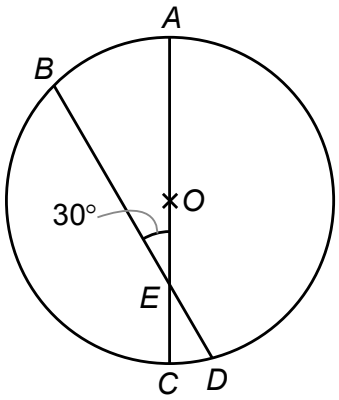
A. 5 : 8.

B. 5 : 13.

C. 8 : 5.

D. 8 : 13.

6. In the figure, O is the centre of the circle. Diameter AC and chord BD intersect at E. If $\angle AEB = 30°$ and $\overset{\frown}{AB} : \overset{\frown}{BC} = 1:3$, then $\overset{\frown}{AB} : \overset{\frown}{CD} =$



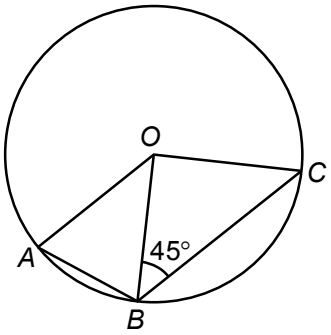
A. 1 : 1.

B. 2 : 1.

C. 3 : 1.

D. 3 : 2.

7. In the figure, O is the centre of the circle. $\overset{\frown}{AB} : \overset{\frown}{BC} = 1:2$ and $\angle OBC = 45°$.



Which of the following must be true?

I. $OA // CB$

II. $\angle OAC = 22.5°$

III. $2AB > BC$

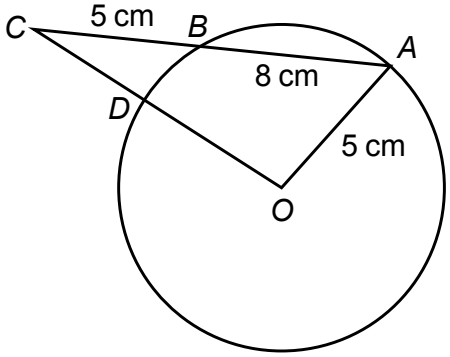
A. I and II only

B. I and III only

C. II and III only

D. I, II and III

8. In the figure, O is the centre of the circle. Chord AB and radius OD are produced to meet at C. $AB = 8$ cm and $OA = BC = 5$ cm. Find the length of CD.



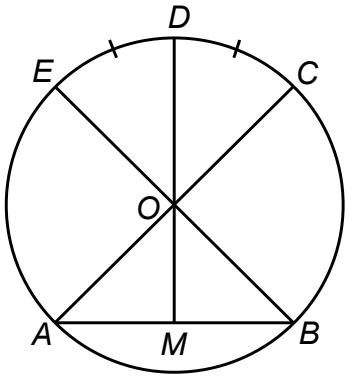
A. 4.49 cm (corr. to 3 sig. fig.)

B. 4.74 cm (corr. to 3 sig. fig.)

C. 6.49 cm (corr. to 3 sig. fig.)

D. 9.49 cm (corr. to 3 sig. fig.)

9. In the figure, O is the centre of the circle. AC and BE are diameters. $\overset{\frown}{CD} = \overset{\frown}{DE}$. DO produced and AB intersect at M.



Which of the following must be true?

I. $\angle COD = \angle EOD$

II. $\Delta OMA \cong \Delta OMB$

III. $OM \perp AB$

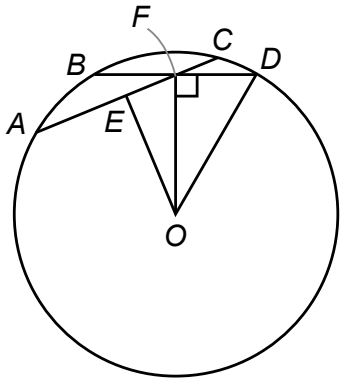
A. I and II only

B. I and III only

C. II and III only

D. I, II and III

10. In the figure, chords AC and BD intersect at F such that $OF \perp BD$. E is the mid-point of AC. It is given that $OD = 15$ cm, $OE = 12$ cm and $BD = 4\sqrt{14}$ cm. Find the length of CF.



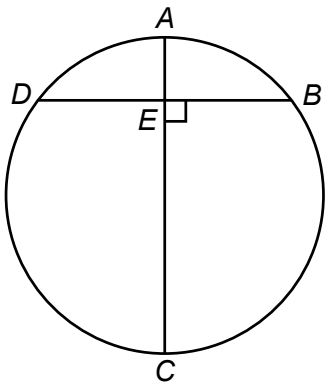
A. 4 cm

B. 4.5 cm

C. 5 cm

D. 9 cm

11. In the figure, diameter AC and chord BD intersect perpendicularly at E. If $AE = 8$ cm and $BD = 32$ cm, find the radius of the circle.



A. 13.9 cm (corr. to 1 d.p.)

B. 16 cm

C. 17.9 cm (corr. to 1 d.p.)

D. 20 cm

12. The radius of a circle is 13 cm and the length of chord BC is 24 cm. If A is a point lying on the minor arc BC, find the greatest possible area of ΔABC.

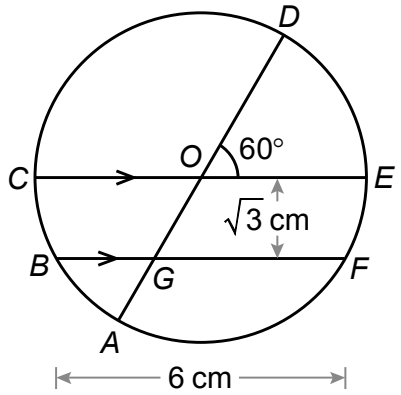
A. $48\ \text{cm}^2$

B. $96\ \text{cm}^2$

C. $156\ \text{cm}^2$

D. $216\ \text{cm}^2$

13. In the figure, O is the centre of the circle $ABCDEF$. COE is a straight line. Diameter AD and chord BF intersect at G. $CE // BF$.



Which of the following must be true?

I. $OB = \sqrt{39}$ cm

II. $\overset{\frown}{AB} : \overset{\frown}{DE} = 1:2$

III. $OB \perp AC$

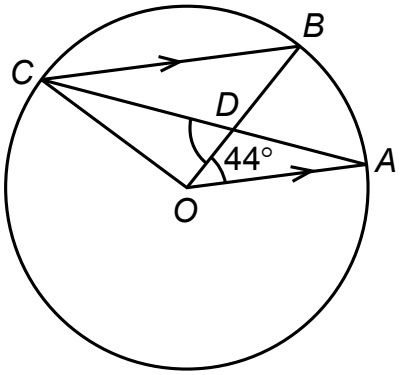
A. I and II only

B. I and III only

C. II and III only

D. I, II and III

14. In the figure, O is the centre of the circle. Chord AC and radius OB intersect at D. $OA // CB$ and $\angle AOB = 44°$. Find $\angle ODC$.



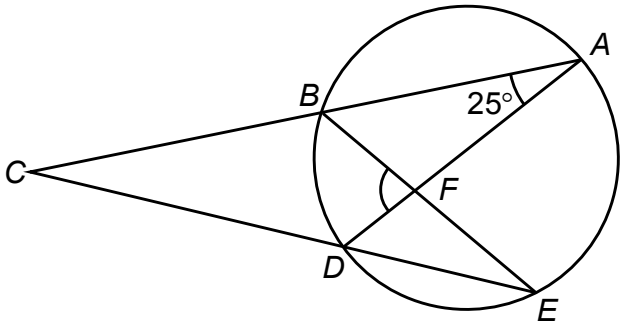
A. 22°

B. 44°

C. 66°

D. 88°

15. In the figure, chords AD and BE intersect at F. ABC and EDC are straight lines. $AD = CD$ and $\angle BAF = 25°$. Find $\angle BFD$.



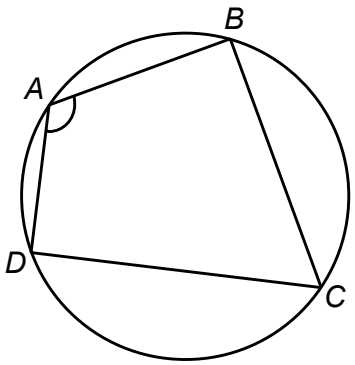
A. 50°

B. 75°

C. 80°

D. 105°

16. In the figure, $\overset{\frown}{AB} = 4$, $\overset{\frown}{BC} = 6$, $\overset{\frown}{CD} = 7$ and $\overset{\frown}{AD} = 3$. Find $\angle BAD$.



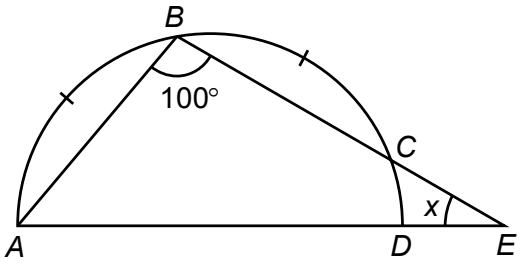
A. 63°

B. 108°

C. 117°

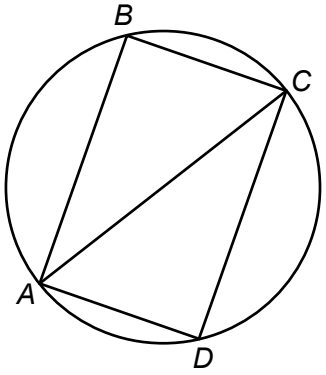
D. 126°

17. In the figure, $ABCD$ is a semi-circle. Diameter AD and chord BC are produced to meet at E. If $\overset{\frown}{AB} = \overset{\frown}{BC}$ and $\angle ABC = 100°$, then $x =$



A. 10°.
B. 20°.
C. 30°.
D. 40°.

18. In the figure, AC is a diameter. $\overset{\frown}{AB} = \overset{\frown}{CD}$.



Which of the following must be true?

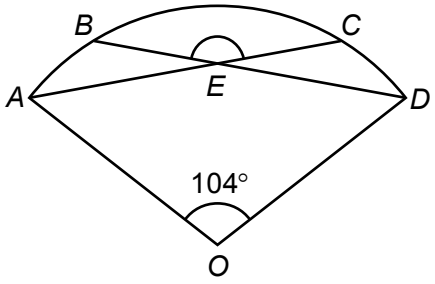
I. $\Delta ABC \cong \Delta CDA$

II. $\overset{\frown}{BD} = \frac{1}{2} \times$ circumference

III. $ABCD$ is a rectangle.

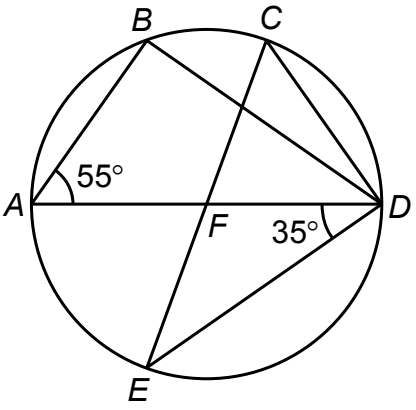
A. I and II only
B. I and III only
C. II and III only
D. I, II and III

19. In the figure, $OABCD$ is a sector. It is given that AEC and BED are straight lines. If $2\overset{\frown}{AB} = \overset{\frown}{BC} = 2\overset{\frown}{CD}$ and $\angle AOD = 104°$, find $\angle BEC$.



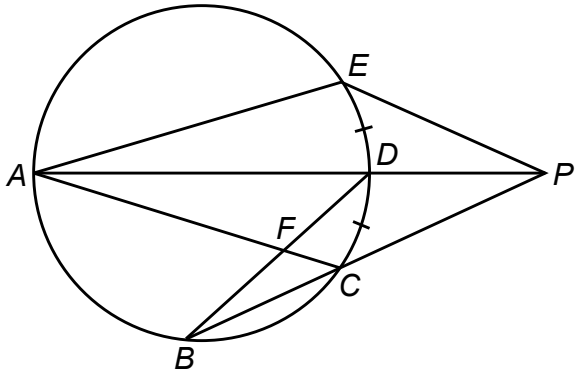
A. 104°
B. 154°
C. 159.2°
D. 167°

20. In the figure, diameter AD and chord CE intersect at F. It is given that $\overset{\frown}{BC} : \overset{\frown}{AE} = 4:7$, $\angle BAD = 55°$ and $\angle ADE = 35°$. Find $\angle AFE$.



A. 55°
B. 57.5°
C. 70°
D. 90°

21. In the figure, AD is a diameter of the circle and $\overset{\frown}{CD} = \overset{\frown}{DE}$. Chords AC and BD intersect at F. ADP and BCP are straight lines.



Which of the following must be true?

I. $\Delta EAP \sim \Delta CAP$

II. $\Delta PAC \sim \Delta PBD$

III. $\Delta EAP \sim \Delta DBP$

A. I only

B. II only

C. III only

D. I, II and III