



# Myfuture CBC Revision

## core mathematics - Grade 10

### Question Paper

1. If point (3, 1) is rotated  $90^\circ$  anticlockwise about the origin, what are the coordinates of its image?

- A. (1, -3)
- B. (-1, 3)
- C. (-3, -1)
- D. (3, -1)

2. A pizza has radius 12 cm. What is the area of a  $45^\circ$  slice?

- A.  $36 \text{ cm}^2$
- B.  $18 \text{ cm}^2$
- C.  $6 \text{ cm}^2$
- D.  $9 \text{ cm}^2$

3. A car moving at 20 m/s decelerates uniformly at  $5 \text{ m/s}^2$  to a stop. How far does it travel before stopping?

- A. 20 m
- B. 10 m
- C. 100 m
- D. 40 m

4. A circle has radius 10 cm and a central angle of  $60^\circ$ . Find the area of the corresponding minor segment (area between chord and arc).

- A.  $100/6 + 253 \text{ cm}^2$
- B.  $25/3 - 503 \text{ cm}^2$
- C.  $50 - 253 \text{ cm}^2$
- D.  $50/3 - 253 \text{ cm}^2$

5. If a point on a circle is rotated about the centre by angle  $\theta$ , which of these is true?

- A. Its distance from the centre becomes  $r \cos \theta$
- B. Its distance becomes  $r + \theta$
- C. It moves along the circle and its distance from centre remains  $r$
- D. It moves to a different circle

6. Find the area of a quarter circle of radius 8 cm.

- A.  $32 \text{ cm}^2$
- B.  $16 \text{ cm}^2$
- C.  $64 \text{ cm}^2$
- D.  $8 \text{ cm}^2$

7. Which of the following transformations is NOT a rotation?

- A. Turning a point about itself by any angle
- B. Sliding a square 5 cm to the right
- C. Turning a kite about its centre by  $180^\circ$
- D. Rotating a star shape  $72^\circ$  about its centre

8. What is the instantaneous speed of an object?

- A. Average speed over a long trip
- B. Change in velocity
- C. Total distance divided by total time
- D. Speed measured at a specific instant in time

9. Which regular polygon has rotational symmetry of order 5?

- A. Equilateral triangle
- B. Regular pentagon
- C. Square
- D. Regular hexagon

10. A transformation maps triangle ABC to A'B'C' by a rotation. Which property must be true?

- A. Angles at corresponding vertices are equal and corresponding sides are equal
- B. Lengths AB and A'B' need not be equal
- C. Only the angles are preserved, sides may change
- D. Orientation is reversed

11. A cyclist covers 4 km in 15 minutes. What is the average speed in km/h?

- A. 20 km/h
- B. 4 km/h
- C. 16 km/h
- D. 1 km/h

12. If a rotation matrix in the plane has determinant 1, what does this indicate about the transformation?

- A. It preserves orientation and area (is a rotation or rotation+translation)
- B. It scales areas by 2
- C. It reverses orientation
- D. It is a reflection

13. A lorry covers 360 km in 4 hours. What is its speed in metres per second?

- A. 100 m/s
- B. 10 m/s
- C. 90 m/s
- D. 25 m/s

14. A circular garden radius 9 m has a path of width 2 m around it. What is the area of the path in exactly one quarter of the circle?

- A. 16 m<sup>2</sup>
- B. 32 m<sup>2</sup>
- C. 4 m<sup>2</sup>
- D. 8 m<sup>2</sup>

15. Which of these is the centre of rotation property?

- A. The centre of rotation remains fixed while other points move around it
- B. Only points on the axis of reflection stay fixed
- C. The centre moves to a new position after rotation
- D. All points remain fixed

16. Two cars 500 m apart move towards each other at 15 m/s and 10 m/s. How long until they meet?

- A. 50 s
- B. 20 s
- C. 33.3 s
- D. 10 s

17. Two cars start 200 km apart and travel towards each other with speeds 40 km/h and 60 km/h. How long until they meet?

- A. 3 hours
- B. 2 hours
- C. 1 hour
- D. 4 hours

18. Find the area of a quarter circle whose diameter is 14 cm.

- A.  $49/2$  cm<sup>2</sup>
- B.  $49/4$  cm<sup>2</sup>
- C. 14 cm<sup>2</sup>
- D.  $196/4$  cm<sup>2</sup>

19. Runner A completes 100 m in 12 s and Runner B completes 100 m in 10 s. Who has the greater average speed?

- A. Runner A
- B. Runner B
- C. They have same speed
- D. Cannot determine without direction

20. Which angle of rotation takes point (1,1) to (-1,-1) about the origin?

- A. 45° rotation
- B. 90° anticlockwise
- C. 180° rotation
- D. 270° anticlockwise

21. The position of a particle is given by  $s(t) = 3t^2 + 2t$  (s in metres, t in seconds). What is its velocity at  $t = 2$  s?

- A. 8 m/s
- B. 10 m/s
- C. 12 m/s
- D. 14 m/s

22. Find the area of a sector with radius 5 cm and central angle 2 radians.

- A. 50 cm<sup>2</sup>
- B. 25 cm<sup>2</sup>
- C. 10 cm<sup>2</sup>
- D. 5 cm<sup>2</sup>

23. A stone is dropped from rest and falls with acceleration 2 m/s<sup>2</sup> for 5 s. How far does it fall (use  $s = ut + \frac{1}{2}at^2$ )?

- A. 25 m
- B. 5 m
- C. 50 m
- D. 10 m

24. An arc of length 11 cm corresponds to a sector whose area is 38.5 cm<sup>2</sup>. Find the radius of the circle.

- A. 5 cm
- B. 7 cm
- C. 11 cm
- D. 14 cm

25. Which best describes uniform motion?

- A. Speed changing with time
- B. Motion along a circle
- C. Constant speed in a straight line
- D. Zero acceleration only at the start

26. On a speed–time graph, the area under the curve between two times represents:

- A. Acceleration
- B. Instantaneous speed
- C. Distance travelled
- D. Slope of the distance–time graph

27. Point A is at (1, 0). After rotation about the origin it moves to (0, 1). What is the angle and direction of rotation?

- A. 180° anticlockwise
- B. 90° clockwise
- C. 270° clockwise
- D. 90° anticlockwise

28. What is the smallest positive angle of rotation that maps a regular hexagon onto itself?

- A. 120°
- B. 60°
- C. 45°
- D. 90°

29. A bus travels 240 km at a steady speed of 80 km/h. How long does the journey take?

- A. 2 hours
- B. 1.5 hours
- C. 4 hours
- D. 3 hours

30. A triangle is rotated through  $120^\circ$  about a point to match its original position. What does this say about the triangle?

- A. It is a right-angled triangle
- B. It is isosceles only
- C. It has rotational symmetry of order 3 (likely equilateral)
- D. It cannot have rotational symmetry

31. An annular sector has outer radius 15 cm, inner radius 9 cm and central angle  $60^\circ$ . Find its area.

- A.  $12 \text{ cm}^2$
- B.  $48 \text{ cm}^2$
- C.  $36 \text{ cm}^2$
- D.  $24 \text{ cm}^2$

32. A car starts from rest and accelerates uniformly at  $2 \text{ m/s}^2$  for 5 s. What is its final speed?

- A. 5 m/s
- B. 2.5 m/s
- C. 10 m/s
- D. 20 m/s

33. A semicircular swimming pool has radius 5 m. What is its area?

- A.  $12.5 \text{ m}^2$
- B.  $6.25 \text{ m}^2$
- C.  $25 \text{ m}^2$
- D.  $50 \text{ m}^2$

34. A particle's velocity is 10 m/s. What does the negative sign indicate?

- A. The particle is at rest
- B. The particle's speed is 10 m/s
- C. The particle is moving in the direction defined as negative (opposite the chosen)
- D. The particle is slowing down at  $10 \text{ m/s}^2$

35. A particle has initial speed 5 m/s, accelerates at  $2 \text{ m/s}^2$  for 10 m. What is its final speed? Use  $v^2 = u^2 + 2as$ .

- A. 9.00 m/s
- B. 10 m/s
- C. Approximately 8.06 m/s
- D. 7.00 m/s

36. A point is 5 cm from the centre of rotation. After a rotation of  $45^\circ$ , what is its distance from the centre?

- A. 5 cm
- B. 52 cm
- C. 0 cm
- D.  $5 \cos 45^\circ \text{ cm}$

37. A cyclist covers the first half of a journey at 12 km/h and the second half at 18 km/h (equal distances). What is the average speed for the whole journey?

- A. 14.4 km/h
- B. 15 km/h
- C. 15.6 km/h
- D. 16.0 km/h

38. A circle of radius 12 cm has a sector with central angle  $30^\circ$ . Find the area of the corresponding segment (sector minus triangle).

- A.  $24 - 18 \text{ cm}^2$
- B.  $12 - 36 \text{ cm}^2$
- C.  $6 - 36 \text{ cm}^2$
- D.  $12 + 36 \text{ cm}^2$

39. Find the area of the segment of a circle with radius 9 cm and central angle  $120^\circ$  (minor segment).

- A.  $9 - (81\sqrt{3})/4 \text{ cm}^2$
- B.  $27 - (81\sqrt{3})/4 \text{ cm}^2$
- C.  $18 - (81\sqrt{3})/2 \text{ cm}^2$
- D.  $27 + (81\sqrt{3})/4 \text{ cm}^2$

40. Two successive rotations about the same centre are  $60^\circ$  and  $150^\circ$ . What single rotation is equivalent to these two?

- A.  $210^\circ$  rotation
- B.  $60^\circ$  rotation only
- C.  $150^\circ$  rotation only
- D.  $90^\circ$  rotation

41. Convert 72 km/h to metres per second (m/s).

- A. 20 m/s
- B. 30 m/s
- C. 15 m/s
- D. 25 m/s

42. Two people walk towards each other, one at 4 m/s and the other at 6 m/s. What is their relative speed?

- A. 2 m/s
- B. 6 m/s
- C. 10 m/s
- D. 4 m/s

43. A runner goes 10 km east then 10 km west back to the start. What is the displacement?

- A. 0 km
- B. 20 km
- C. 10 km west
- D. 10 km east

44. A semicircular garden has diameter 20 m. What is its area?

- A.  $200 \text{ m}^2$
- B.  $50 \text{ m}^2$
- C.  $100 \text{ m}^2$
- D.  $25 \text{ m}^2$

45. An arc length of a sector is 22 cm and the radius of the circle is 7 cm. Find the area of that sector.

- A.  $49 \text{ cm}^2$
- B.  $11 \text{ cm}^2$
- C.  $22 \text{ cm}^2$
- D.  $7 \text{ cm}^2$

46. A car travels at 20 m/s for 10 s, then at 10 m/s for 10 s. What is its average speed over the 20 s?

- A. 20 m/s
- B. 30 m/s
- C. 10 m/s
- D. 15 m/s

47. Convert 18 m/s to km/h.

- A. 100 km/h
- B. 6.48 km/h
- C. 64.8 km/h
- D. 18 km/h

48. A circular window has radius 3 m. What is the area of the top quarter covered by a metal decoration?

- A.  $9/4 \text{ m}^2$
- B.  $27/4 \text{ m}^2$
- C.  $9/2 \text{ m}^2$
- D.  $3/4 \text{ m}^2$

49. What are the SI units of acceleration?

- A. Metres per second (m/s)
- B. Metres per second squared ( $\text{m/s}^2$ )
- C. Kilometres per hour (km/h)
- D. Metres (m)

50. A car moves along a straight line in the negative direction. Which sign would its displacement have if we take positive to the right?

- A. Positive
- B. Undefined
- C. Negative
- D. Zero always