Myfuture CBC Revision

core mathematics - Grade 10

Question Paper

1. A bag contains 3 red balls and 2 blue balls. One ball is drawn at random. What is the probability it is blue?

A. 3/5

B. 1/2

C. 2/5

D. 1/5

2. Which equation has two equal real roots?

A. x^2 + x + 1 = 0

B. x^2 - 4x + 4 = 0

C. x^2 - 5x + 6 = 0

D. x^2 - 2x - 3 = 0

3. Two successive rotations about the same centre are 60° and 150°. What single rotation is equivalent to these two?

A. 150° rotation only

B. 90° rotation

C. 60° rotation only

D. 210° rotation

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

A. It is a reflection

B. It scales areas by 2

C. It reverses orientation

D. It preserves orientation and area (is a rotation or rotation+translation)

5. A triangle is rotated through 120° about a point to match its original position. What does this say about the triangle?

A. It has rotational symmetry of order 3 (likely equilateral)

B. It cannot have rotational symmetry

C. It is isosceles only

D. It is a right-angled triangle

6. What is the discriminant of 2x^2 - 4x + 1 = 0, and what does it tell you about the roots?

A. Discriminant = -8; two complex roots

B. Discriminant = 0; one repeated real root

C. Discriminant = 8; two distinct real roots

D. Discriminant = 4; two equal real roots

7. A week has seven days. If one day is chosen at random, what is the probability it is a weekend day (Saturday or Sunday)?

A. 1/7

B. 2/5

C. 5/7

D. 2/7

8. A circle has radius 10 cm and a central angle of 60°. Find the area of the corresponding minor segment (area between chord and arc).

A. 50 253 cm²

B. 100/6 + 253 cm²

C. 25/3 503 cm²

D. 50/3 253 cm²

9. A letter 'Z' written in the same orientation is rotated 180° and still looks like a 'Z'. What is the order of rotational symmetry of the letter Z?

A. 3

B. 4

C. 2

D. 1

10. An object starting from rest accelerates uniformly at 4 m/s². How long does it take to reach 20 m/s?

A. 5 s

B. 10 s

C. 8 s

D. 4 s

11. A square is rotated by 90° about its centre. Which property remains unchanged?

A. Number of sides but not side lengths

B. Side lengths and angles but orientation may change

C. Only the orientation changes

D. Side lengths, angles and orientation

12. If a quadratic has roots 4 and -2, what is a possible quadratic equation with leading coefficient 1?

A. x^2 + 2x - 8 = 0

B. x^2 - 6x + 8 = 0

C. x^2 - 2x - 8 = 0

D. x^2 + 6x + 8 = 0

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

A. 33.3 s

B. 10 s

C. 50 s

D. 20 s

14. What is the vertex of the parabola y = x^2 - 6x + 8?

A. (3, -1)

B. (1, 3)

C. (-3, 1)

D. (3, -1)

15. If P(A) = 0.6 and A and B are mutually exclusive, what is the maximum possible value of P(B)?

A. 0.2

B. 0.6

C. 1.0

D. 0.4

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

A. 64.8 km/h

B. 100 km/h

C. 18 km/h

D. 6.48 km/h

17. If a shape is rotated 270° anticlockwise about the origin, this is equivalent to which clockwise rotation?

A. 60° clockwise

B. 90° clockwise

C. 90° anticlockwise

D. 180° clockwise

18. Which quadratic equation represents a parabola that opens downward?

A. x^2 - 3x + 2 = 0

B. 2x^2 + x + 1 = 0

C. -x^2 + 3x + 2 = 0

D. x^2 + 0x + 1 = 0

19. If f(x) = x^2 + bx + 16 and one root is 4, what is b?

A. 8

B. -4

C. -8

D. 4

20. Using the quadratic formula, what is one root of x^2 - 2x - 3 = 0?

A. x = 1

B. x = -3

C. x = -1

D. x = 3

21. What is the probability of getting a head when a fair coin is tossed once?

A. 1/4

B. 2/3

C. 1/2

D. 1/3

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

A. 25 m²

B. 6.25 m²

C. 50 m²

D. 12.5 m²

23. Find the area of the shaded region that is a semicircular ring between radii 10 m and 6 m.

A. 16 m²

B. 54 m²

C. 8 m²

D. 32 m²

24. If two events are independent, which formula gives P(A and B)?

A. P(A) P(B)

B. P(A) / P(B)

C. P(A) + P(B)

D. P(A) × P(B)

25. If the probability of event A is 0.25 and probability of event B is 0.4, what is the smallest possible value of P(A and B)?

A. 0.15

B. 0

C. 0.25

D. 0.65

26. In an experiment, probability of rain today is 0.4 and probability of rain tomorrow is 0.5. If events are independent, what is the probability it rains both days?

A. 0.1

B. 0.45

C. 0.2

D. 0.9

27. 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. Cannot determine without direction

C. They have same speed

D. Runner B

28. A single card is drawn from a well-shuffled deck of 52 cards. What is the probability the card is a heart?

A. 1/4

B. 1/13

C. 1/2

D. 3/4

29. How long will it take to cover 500 m at a steady speed of 5 m/s?

A. 100 s

B. 50 s

C. 2500 s

D. 10 s

30. A student performs an experiment and finds that event A occurred in 30 out of 120 trials. What is the experimental probability of A?

A. 1/5

B. 1/3

C. 1/4

D. 1/2

31. Which transformation preserves orientation: rotation, reflection, or both?

A. Both rotation and reflection

B. Neither rotation nor reflection

C. Reflection only

D. Rotation only

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

A. The particle is slowing down at 10 m/s²

B. The particle is moving in the direction defined as negative (opposite the chosen
C. The particle's speed is 10 m/s

D. The particle is at rest

33. A regular decagon (10 sides) is rotated by 36°. Which statement is true?

A. Only 72° would map it onto itself

B. It has order 5

C. 36° is not a symmetry rotation

D. 36° maps it onto itself and it has order 10

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

A. Turning a kite about its centre by 180°

B. Turning a point about itself by any angle

C. Sliding a square 5 cm to the right

D. Rotating a star shape 72° about its centre

35. A car starts from rest and accelerates uniformly at 2 m/s² for 5 s. What is its final speed?

A. 10 m/s

B. 5 m/s

C. 20 m/s

D. 2.5 m/s

36. A car accelerates uniformly from rest to 20 m/s in 10 s. What is its acceleration?

A. 200 m/s^2

B. 0.5 m/s^2

C. 2 m/s^2

D. 10 m/s^2

37. A pizza has radius 12 cm. What is the area of a 45° slice?

A. 9 cm²

B. 36 cm²

C. 6 cm²

D. 18 cm²

38. A stone is dropped from rest and falls with acceleration 2 m/s^2 for 5 s. How far does it fall (use s = ut + 1/2 at^2)?

A. 50 m

B. 25 m

C. 10 m

D. 5 m

39. A fair six-faced die is rolled twice. What is the probability the sum is 7?

A. 1/3

B. 1/9

C. 1/12

D. 1/6

40. What must be true about the coefficient b in ax^2 + bx + c if the parabola is symmetric about the y-axis?

A. b = a

B. b = 0

C. b = -a

D. b = c

41. A bag contains 4 white and 6 black beads. One bead is drawn. Which event has higher probability: drawing a white bead or drawing a black bead?

A. Drawing a white bead

B. Drawing a black bead

C. They have equal probability

D. Impossible to tell

42. A student travels 30 km in 0.5 hours and then 45 km in 1.0 hour. What is the student's average speed for the whole trip?

A. 30 km/h

B. 60 km/h

C. 50 km/h

D. 45 km/h

43. Which of these quadratics has no real roots?

A. x^2 - 4x + 3

B. x^2 + 2x - 3

C. x^2 - 6x + 9

D. x^2 + 4x + 5

44. 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

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

A. 90 m/s

B. 25 m/s

C. 100 m/s

D. 10 m/s

46. On a distance-time graph, what does the slope of the line represent?

A. Acceleration

B. Time taken

C. Speed

D. Total distance

47. If point (3, 1) is rotated 90° anticlockwise about the origin, what are the coordinates of its image?

A. (-1, 3)

B. (1, -3)

C. (-3, -1)

D. (3, -1)

48. A fair coin is tossed 4 times. How many possible equally likely outcomes are there?

A. 12

B. 16

C. 8

D. 4

49. Which best describes uniform motion?

A. Zero acceleration only at the start

B. Speed changing with time

C. Constant speed in a straight line

D. Motion along a circle

50. A vehicle starts from rest with constant acceleration 3 m/s² for 4 s. How far does it travel in that time?

A. 36 m

B. 12 m

C. 24 m

D. 48 m