Playing with Constructions

Standard difficulty · 20 questions · 40 marks · Time: 28 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. What is the diameter of a circle of radius 5 cm?
(a) 2.5 cm **(b)** 10 cm **(c)** 25 cm **(d)** 7 cm

2. A circle has a diameter of 32 cm. How wide must the compass be opened to draw it?
(a) 16 cm **(b)** 32 cm **(c)** 64 cm **(d)** 17 cm

3. The instrument used to draw a circle is a:
(a) protractor **(b)** ruler **(c)** compass **(d)** set square

4. A circle has a radius of 12 cm. A point is 3 cm from its centre. The point lies:
(a) outside the circle **(b)** at the centre
(c) on the circle **(d)** inside the circle

5. What is the perimeter of a rectangle 18 cm long and 2 cm wide?
(a) 40 cm **(b)** 20 cm **(c)** 36 cm **(d)** 38 cm

6. The diagonals of a rectangle are each 18 cm long. How far is it from the corner to the point where they cross?
(a) 9 cm **(b)** 36 cm **(c)** 18 cm **(d)** 10 cm

7. To draw a circle of radius 4 cm, the compass is opened to:
(a) 16 cm **(b)** 4 cm **(c)** 8 cm **(d)** 2 cm

8. Two circles have radii 7 cm and 3 cm, and their centres are 9 cm apart. The circles:
(a) cross at two points **(b)** are the same circle
(c) touch at one point **(d)** do not meet

Section B — Short answer — 8 × 2 = 16 marks

9. A rectangle has a perimeter of 38 cm and a length of 14 cm. Find its width.

10. A square has a perimeter of 16 cm. How long is each side? What is each angle?

11. 5 circles, each of radius 7 cm, are drawn in a row, each touching the next, with their centres on one line. How long is the row from end to end?

12. A circle has a radius of 10 cm. Points P, Q and R are 14 cm, 3 cm, 13 cm from its centre. Say whether each is inside, on or outside the circle.

13. Two circles of radii 10 cm and 9 cm touch from the outside. How far apart are their centres?

14. A rectangle is 8 cm by 6 cm. How many right angles does it have, and what is the total length of its four sides?

15. The diagonals of a square are 38 cm long. How long is the other diagonal, and at what angle do they cross?

16. A chord passes through the centre of a circle of radius 22 cm. What is this chord called, and how long is it?

Section C — Word problems — 4 × 4 = 16 marks

17. Vikram has a piece of wire 130 cm long and bends it into a rectangle 62 cm long, using all of the wire. How wide is the rectangle? If it were bent into a square instead, how long would each side be?

18. A circular flower bed has a radius of 10 m. A straight path is made across it, through the centre. How long is the path? A gardener stands on the edge of the bed. How far is the gardener from the centre?

19. Round tokens of radius 3 cm are laid in a straight line along a ruler, each touching the next. How many tokens fit exactly along 60 cm? How far apart are the centres of the first and last tokens?

20. Vikram draws a square of side 12 cm and then a circle with its centre at one corner and radius 12 cm. How many corners of the square lie on the circle? How long is the diameter of the circle?

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Answer key

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Q	Answer	Working
1	**(b) 10 cm**	2 × 5 = 10
2	**(a) 16 cm**	the compass opening is the radius: 32 ÷ 2 = 16
3	**(c) compass**	—
4	**(d) inside the circle**	compare 3 cm with the radius 12 cm
5	**(a) 40 cm**	2 × (18 + 2) = 40
6	**(a) 9 cm**	the diagonals cut each other in half: 18 ÷ 2
7	**(b) 4 cm**	the gap is the radius
8	**(a) cross at two points**	9 is between 4 and 10
9	**5 cm**	38 ÷ 2 = 19; 19 − 14 = 5
10	**4 cm; 90°**	16 ÷ 4 = 4
11	**70 cm**	5 diameters: 5 × 14 = 70
12	**P outside, Q inside, R outside**	compare each distance with 10 cm
13	**19 cm**	10 + 9 = 19
14	**4 right angles; 28 cm**	8 + 6 + 8 + 6 = 28
15	**38 cm; 90°**	the diagonals of a square are equal and cross at right angles
16	**a diameter; 44 cm**	2 × 22 = 44
17	**3 cm wide; square side 32.5 cm**	130 ÷ 2 − 62 = 3; 130 ÷ 4 = 32.5
18	**20 m; 10 m**	the path is a diameter (2 × 10); every point on the edge is one radius away
19	**10 tokens; 54 cm**	each token takes 6 cm: 60 ÷ 6 = 10; 9 gaps of 6 cm
20	**2 corners; 24 cm**	the two corners next to the centre are 12 cm away; the far corner is farther

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