GCSE Foundation Mathematics
Practice Test 1: Geometry and Measures

Instructions:
Answer all questions. Show your working clearly.
Calculators may be used unless stated otherwise.
Time allowed: 90 minutes

Section A: Angles

1. Classify these angles as acute, obtuse, or reflex:
   (a) 45°
   (b) 120°
   (c) 270°
   (d) 85°
   (e) 200°
   (f) 15°
2. Find the missing angles:
   (a) Two angles on a straight line are 65° and x°. Find x.
   (b) Three angles around a point are 85°, 140°, and y°. Find y.
   (c) Two angles are vertically opposite. One angle is 75°. Find the other angle.
3. In a triangle, two angles are 40° and 75°. Find the third angle.
4. The angles in a triangle are in the ratio $2 : 3 : 4$. Find the size of each angle.
5. Find the missing angles in these triangles:
   (a) An isosceles triangle with base angles of x° and vertex angle of 40°
   (b) An equilateral triangle (all angles equal)
   (c) A right-angled triangle with one angle of 35°

Section B: Polygons and Angle Rules

6. Find the sum of interior angles for:
   (a) A pentagon (5 sides)
   (b) A hexagon (6 sides)
   (c) An octagon (8 sides)
   (d) A decagon (10 sides)

7. Find the size of each interior angle in:
   (a) A regular pentagon
   (b) A regular hexagon
   (c) A regular octagon
   (d) A square
8. Find the size of each exterior angle in:
   (a) A regular pentagon
   (b) A regular hexagon
   (c) A regular decagon
   (d) An equilateral triangle
9. A regular polygon has an exterior angle of 30°. How many sides does it have?
10. In a quadrilateral, three angles are 85°, 95°, and 110°. Find the fourth angle.
11. A regular polygon has an interior angle of 140°. Find:
    (a) The exterior angle
    (b) The number of sides

Section C: Properties of Shapes

12. State the properties of these quadrilaterals:
    (a) Rectangle (sides, angles, diagonals)
    (b) Rhombus (sides, angles, diagonals)
    (c) Parallelogram (sides, angles, diagonals)
    (d) Trapezium (sides, angles)
13. How many lines of symmetry do these shapes have?
    (a) Equilateral triangle
    (b) Square
    (c) Rectangle
    (d) Regular hexagon
    (e) Isosceles triangle
    (f) Rhombus
14. What is the order of rotational symmetry for:
    (a) Square
    (b) Equilateral triangle
    (c) Regular pentagon
    (d) Rectangle
15. Name these 3D shapes:
    (a) 6 rectangular faces
    (b) 2 circular faces and 1 curved surface
    (c) 1 circular face and 1 curved surface coming to a point

(d) 4 triangular faces

(e) 1 square base and 4 triangular faces

16. How many faces, edges, and vertices do these shapes have?

(a) Cube

(b) Triangular prism

(c) Square-based pyramid

(d) Pentagonal prism

Section D: Transformations

17. Describe the transformation that maps:

(a) Triangle A to Triangle B (reflection in the y-axis)

(b) Triangle B to Triangle C (translation 3 units right, 2 units up)

(c) Triangle C to Triangle D (rotation 90° clockwise about origin)

(d) Triangle D to Triangle E (enlargement scale factor 2, centre origin)

18. A point P(3, 2) is transformed. Find the image coordinates after:

(a) Reflection in the x-axis

(b) Reflection in the y-axis

(c) Reflection in the line $y = x$

(d) Translation by vector $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$

19. A triangle has vertices at A(1, 1), B(3, 1), and C(2, 4). Find the coordinates after:

(a) Rotation 90° clockwise about the origin

(b) Enlargement scale factor 3, centre origin

(c) Translation by vector $\begin{pmatrix} 4 \\ -2 \end{pmatrix}$

20. A shape is enlarged by scale factor $\frac{1}{2}$. If the original area is 24 cm^2, what is the new area?

21. Triangle A is enlarged to Triangle B with scale factor 3. If Triangle A has a perimeter of 12 cm, what is the perimeter of Triangle B?

Section E: Perimeter and Area

22. Calculate the perimeter of these shapes:

(a) Rectangle: length 8 cm, width 5 cm

(b) Square: side length 7 cm

(c) Triangle: sides 6 cm, 8 cm, 10 cm

(d) Regular hexagon: side length 4 cm

23. Calculate the area of these shapes:

(a) Rectangle: length 12 cm, width 7 cm

(b) Square: side length 9 cm

(c) Triangle: base 10 cm, height 6 cm

(d) Parallelogram: base 8 cm, height 5 cm

24. Calculate the area and circumference of circles with:

    (a) Radius 5 cm
    (b) Diameter 14 cm
    (c) Radius 3.5 cm
    (d) Diameter 20 cm

25. A rectangular garden is 15 m long and 8 m wide. Find:

    (a) The perimeter
    (b) The area
    (c) The cost of fencing at £12 per metre
    (d) The cost of turfing at £8 per m^2

26. Find the area of these compound shapes:

    (a) A rectangle 10 cm by 6 cm with a square of side 2 cm removed from one corner
    (b) An L-shape made from two rectangles: 8 cm by 3 cm and 4 cm by 5 cm
    (c) A semicircle with radius 4 cm attached to a rectangle 8 cm by 6 cm

Section F: Volume and Surface Area

27. Calculate the volume of these prisms:

    (a) Cuboid: length 8 cm, width 5 cm, height 4 cm
    (b) Cube: side length 6 cm
    (c) Triangular prism: triangular face area 15 cm^2, length 12 cm
    (d) Cylinder: radius 3 cm, height 10 cm

28. Calculate the surface area of:

    (a) Cube: side length 5 cm
    (b) Cuboid: length 8 cm, width 6 cm, height 4 cm
    (c) Cylinder: radius 4 cm, height 7 cm

29. A cylindrical water tank has radius 2 m and height 3 m. Find:

    (a) The volume in m^3
    (b) The volume in litres (1 m^3 = 1000 litres)
    (c) The curved surface area
    (d) The total surface area

30. A cube has volume 125 cm^3. Find:

    (a) The side length
    (b) The surface area

31. A rectangular swimming pool is 20 m long, 8 m wide, and 2 m deep. Find:

    (a) The volume of water needed to fill it
    (b) The area of the bottom
    (c) The area of the four walls

Section G: Pythagoras' Theorem

32. Use Pythagoras' theorem to find the missing side in these right-angled triangles:

    (a) Two shorter sides are 3 cm and 4 cm. Find the hypotenuse.

    (b) Hypotenuse is 13 cm, one side is 5 cm. Find the other side.

    (c) Two shorter sides are 8 cm and 15 cm. Find the hypotenuse.

    (d) Hypotenuse is 25 cm, one side is 20 cm. Find the other side.

33. A ladder of length 5 m leans against a wall. The bottom of the ladder is 3 m from the wall. How high up the wall does the ladder reach?

34. A rectangle has length 12 cm and width 9 cm. Find the length of its diagonal.

35. Find the distance between these pairs of points:

    (a) (0, 0) and (3, 4)

    (b) (1, 2) and (7, 10)

    (c) (-2, 1) and (4, 9)

36. A right-angled triangle has legs of length x cm and $(x+2)$ cm, and hypotenuse $(x+4)$ cm. Find the value of x.

37. Determine whether these triangles are right-angled:

    (a) Sides 6 cm, 8 cm, 10 cm

    (b) Sides 5 cm, 12 cm, 14 cm

    (c) Sides 7 cm, 24 cm, 25 cm

    (d) Sides 9 cm, 12 cm, 15 cm

Section H: Problem Solving

38. A circular pond has radius 4 m. A path of width 1 m surrounds the pond. Find:

    (a) The area of the pond

    (b) The area of the path

    (c) The total area including the path

39. A regular hexagon has perimeter 30 cm. Find:

    (a) The length of each side

    (b) Each interior angle

    (c) Each exterior angle

40. A cylindrical tin has radius 6 cm and height 10 cm. Find:

    (a) How much it can hold (volume)

    (b) The area of metal needed to make it (surface area)

    (c) The cost of metal at £0.02 per cm^2

41. Triangle ABC is isosceles with AB = AC. Angle BAC = 40°. Find angles ABC and ACB.

42. A square and a circle have the same perimeter. If the square has side length 8 cm, find the radius of the circle.

43. A triangle has vertices at A(2, 1), B(6, 1), and C(4, 5). Find:

    (a) The length of each side

    (b) The perimeter

    (c) The area

    (d) Whether the triangle is right-angled

44. A cone has base radius 5 cm and slant height 13 cm. Find:

    (a) The vertical height

    (b) The volume

    (c) The curved surface area

45. The floor of a room is 6 m by 4 m. Square tiles of side 25 cm are used to cover the floor. How many tiles are needed?

Answer Space

Use this space for your working and answers.

END OF TEST

Total marks: 100

For more resources and practice materials, visit:
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