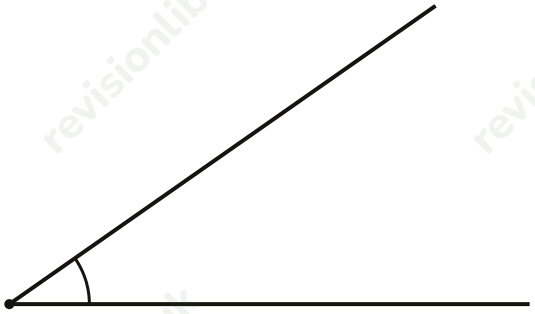
4.6 Measuring, Drawing and Constructing: Test Pack

Calculators not allowed · about 55 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Use a protractor to measure the acute angle shown. Give your answer to the nearest degree.



(1)

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2 Triangle JKL has JL = 7 cm, angle J = 45 degrees and angle L = 55 degrees.

(a) Construct triangle JKL using ruler and protractor. **(2)**

(b) Work out the size of angle K. **(2)**

.....

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3 Draw a right-angled triangle ABC with AB = 9 cm and angle B = 90 degrees. Work out the height from B to the hypotenuse AC (the side opposite the right angle), given that AC = 15 cm.

(4)

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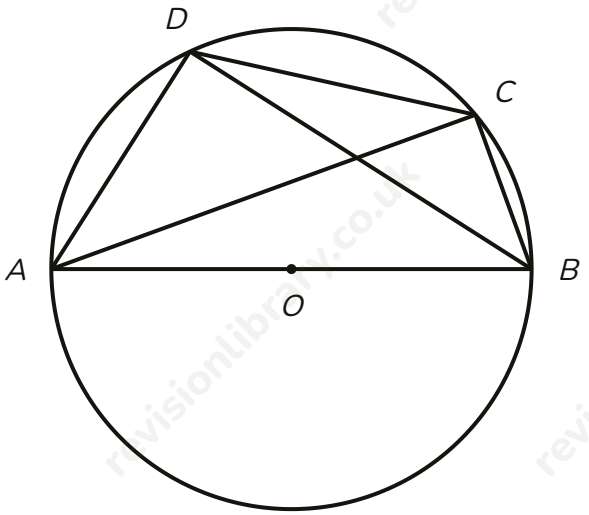
4 Using compasses, construct an equilateral triangle PQR with side length 6 cm. Measure the angle at P and give the value.

(3)

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5 Stretch question. A quadrilateral has vertices A, B, C, D on a circle with centre O. AB is a diameter of the circle and AC is a chord. Prove that angle ADB is a right angle. You may give a brief geometric argument.

Diagram NOT accurately drawn



(4)

6 The line AB is 4 cm long. A point is always exactly 3 cm from the line AB (on both sides) and no closer. Describe the shape of the locus.

(2)

7 A map has a scale of 1 : 10000. A lake is 9.1 cm wide on the map. Work out its real width in metres.

(3)

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8 A dog is tied to a post on a flat field by a rope 8 m long. Describe the shape of the region where the dog can go, and state its radius.

(2)

9 The points A and B are 14 cm apart. A point P is the same distance from A and from B. Describe the line on which P must lie and state how far it crosses AB from A.

(2)

10 Maya measures an angle with a protractor. One arm of the angle passes through the 35° mark and the other arm passes through the 134° mark on the same scale. Work out the size of the angle.

(2)

11 On a centimetre grid, draw a line of length 7.5 cm and then draw its perpendicular through the midpoint. What are the coordinates of the midpoint if the line has endpoints at (2, 3) and (9.5, 3)?

(2)

12 A point P is always the same distance from two straight lines that cross at an angle of 80°. What does the locus of P look like, and what angle does it make with each line?

(3)

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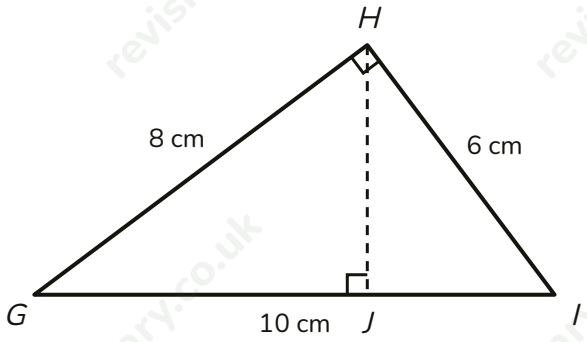
13 Angle XOY is 140 degrees. Construct the angle bisector of angle XOY. What is the size of each angle made by the bisector with the sides OX and OY?

(3)

---

14 A student draws triangle GHI with GH = 8 cm and HI = 6 cm. They mark the perpendicular from H to GI and it meets GI at J. If angle H is 90 degrees, calculate the length of GJ when GJ + JI = GI and GI = 10 cm.

Diagram NOT accurately drawn



(3)

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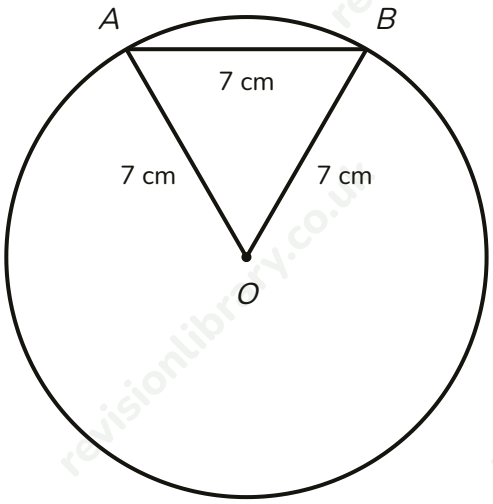
15 Can a triangle be drawn with sides 5 cm, 12 cm and 2 cm? Give a reason for your answer.

(2)

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16 A circle has centre O and radius 7 cm. A chord AB is constructed with length 7 cm. Since OA = OB = AB = 7 cm, state the type of triangle OAB and work out the size of angle AOB.

Diagram NOT accurately drawn



(3)

17 An angle XOY measures 84 degrees. Its bisector OZ is constructed. State the size of angle YOZ.

(1)

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Mark scheme · 4.6 Measuring, Drawing and Constructing: Test Pack

Question 1

35 degrees cao **B1**

Answer: **35 degrees**

Question 2

(a) correct construction approach: draw JL = 7 cm then construct angles 45 degrees at J and 55 degrees at L and join intersection to make K **M1**

(a) triangle constructed with correct vertices and sides visible **A1**

(b) uses angle sum: 45 + 55 + K = 180 or equivalent **M1**

(b) K = 80 degrees cao **A1**

(b) Answer: **80 degrees**

Question 3

recognises relation between sides and right angle and uses area or similar triangles approach: height h satisfies (1/2)*AC*h = (1/2)*AB*BC or uses Pythagoras to find BC first **M1**

finds the other leg BC using Pythagoras: $BC^2 = AC^2 - AB^2 = 15^2 - 9^2 = 144$, so BC = 12 cm **M1**

sets up (1/2)*15*h = (1/2)*9*12 = 54 **A1**

correct final answer h = 108/15 = 7.2 cm cao **A1**

Answer: **7.2 cm**

Question 4

correct construction method: draw side PQ = 6 cm, then arcs radius 6 from P and Q to find R **M1**

completed equilateral triangle PQR with all three sides 6 cm **A1**

measured angle at P = 60 degrees **B1**

Answer: **Equilateral triangle PQR constructed with all three sides 6 cm; angle at P = 60 degrees**

Question 5

states theorem: angle in a semicircle is a right angle or uses that AB is diameter so any angle subtended by AB is 90 degrees **M1**

applies theorem to triangle ADB where A and B are endpoints of diameter and D lies on circle so angle ADB is subtended by diameter **M1**

concludes angle ADB = 90 degrees **A1**

gives brief justification or diagram reference linking diameter to right angle **A1**

Answer: **Angle ADB = 90 degrees**

Question 6

a rectangle-like shape with semicircular ends (a stadium shape) **B1**

straight sides parallel to AB at distance 3 cm **B1**

Answer: **A shape with two parallel straight sides 3 cm from AB and a semicircle of radius 3 cm at each end**

Question 7

9.1 x 10000 **M1**

converts cm to m by ÷ 100 **M1**

910 m cao **A1**

Answer: **910 m**

Question 8

circle **B1**

radius 8 m **B1**

Answer: **A circle (or the inside of a circle) with radius 8 m**

Question 9

perpendicular bisector of AB **B1**

7 cm from A **B1**

Answer: **The perpendicular bisector of AB, crossing AB 7 cm from A**

Question 10

134 - 35 **M1**

99° cao **A1**

Answer: **99°**

Question 11

uses midpoint formula or average of x and y coordinates: ((2 + 9.5)/2 , (3 + 3)/2) **M1**

(5.75, 3) cao **A1**

Answer: **(5.75, 3)**

Question 12

two perpendicular angle bisectors **B1**

halves the angles between the lines: 80/2 and (180 - 80)/2 **M1**

the two bisectors make angles of 40° and 50° respectively with each original line **A1**

Answer: **Two perpendicular angle bisectors, making angles of 40° and 50° respectively with each original line**

Question 13

correct construction method for bisector using arcs from O and intersection points **M1**

states each part is 70 degrees via 140/2 or equivalent **M1**

each angle is 70 degrees cao **A1**

Answer: **70 degrees and 70 degrees**

Question 14

uses GI = 10 and notes GJ + JI = 10 and right triangle properties **M1**

uses Pythagoras in either triangle GHI or decomposition: $GH^2 = (GJ)^2 + (HJ)^2$ and $HI^2 = (JI)^2 + (HJ)^2$ to eliminate HJ **M1**

GJ = 6.4 cm cao (to 1 decimal place) ft from working **A1**

Answer: **6.4 cm**

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Question 15

adds the two shorter sides and compares with the longest	**M1**
No, with the correct comparison	**A1**

Answer: **No**

Question 16

recognises OA = OB = AB so all three sides are equal	**M1**
triangle OAB is equilateral	**A1**
angle AOB = 60 degrees cao	**A1**

Answer: **Equilateral triangle; angle AOB = 60 degrees**

Question 17

42 degrees cao	**B1**

Answer: **42 degrees**

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