Paper Reference(s)

## 5523/03

# Edexcel GCSE

## Mathematics A – 1387

### Paper 3 (Non-Calculator)

# Intermediate Tier

Tuesday 7 November 2006 – Morning

Time: 2 hours

**Materials required for examination**
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

**Items included with question papers**
Nil

## Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
**You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.**
If you need more space to complete your answer to any question, use additional answer sheets.

## Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 26 questions in this question paper. The total mark for this paper is 100.
There are 20 pages in this question paper. Any blank pages are indicated.
**Calculators must not be used.**

## Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.
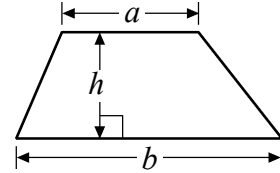
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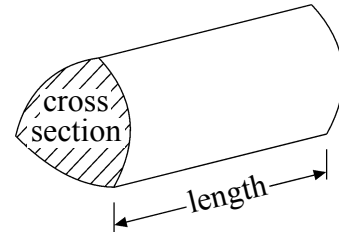*Turn over*

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Formulae: Intermediate Tier

**You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.**

**Area of trapezium** $= \frac{1}{2}(a+b)h$

**Volume of prism** = area of cross section × length

*N24949A0220*

**Answer ALL TWENTY SIX questions.**

**Write your answers in the spaces provided.**

**You must write down all stages in your working.**

**You must NOT use a calculator.**

1. (a) Work out the value of $4^2 + 2^5$

.............................................

**(2)**

(b) Write down the cube root of 64

.............................................

**(1)** **Q1**

**(Total 3 marks)**

2. 70 students each chose one P.E. activity.
They chose one of basketball or swimming or football.
The two-way table shows some information about their choices.

|  | **Basketball** | **Swimming** | **Football** | **Total** |
|---|---|---|---|---|
| **Female** | 10 |  |  | 37 |
| **Male** |  | 17 |  |  |
| **Total** | 19 |  | 22 | 70 |

(a) Complete the two-way table.

**(3)**

One of these students is picked at random.

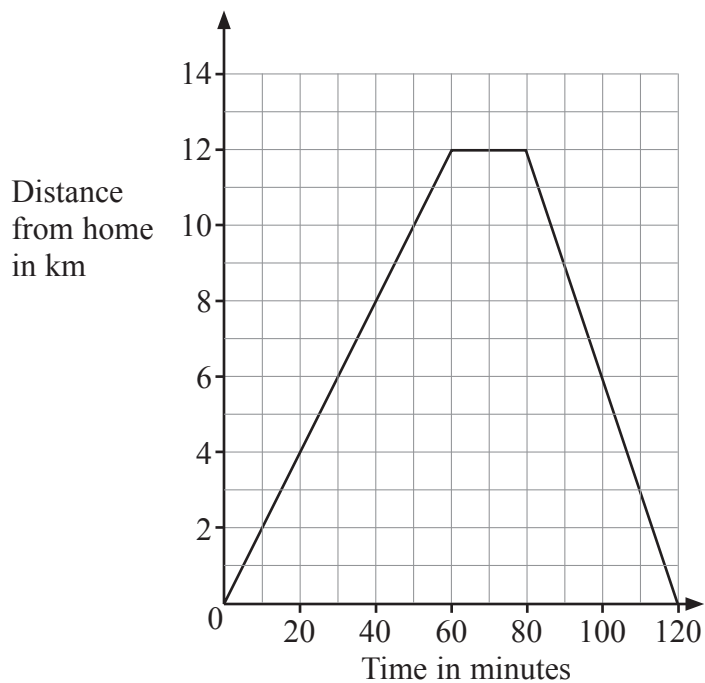(b) Write down the probability that this student chose basketball.

.............................................

**(2)** **Q2**

**(Total 5 marks)**

**3.** Margaret went on a cycle ride.
The travel graph shows Margaret's distance from home on this cycle ride.



(a) How far had Margaret cycled after 30 minutes?

.................................... km
**(1)**

After 60 minutes, Margaret stopped for a rest.

(b) For how many minutes did she rest?

.......................... minutes
**(1)**

(c) How far did Margaret cycle in total on her ride?

.................................... km
**(1)**

**(Total 3 marks)**

Q3

**4.**

Diagrams **NOT**
accurately drawn

BOX    100 cm

40 cm

60 cm

PACKET   10 cm
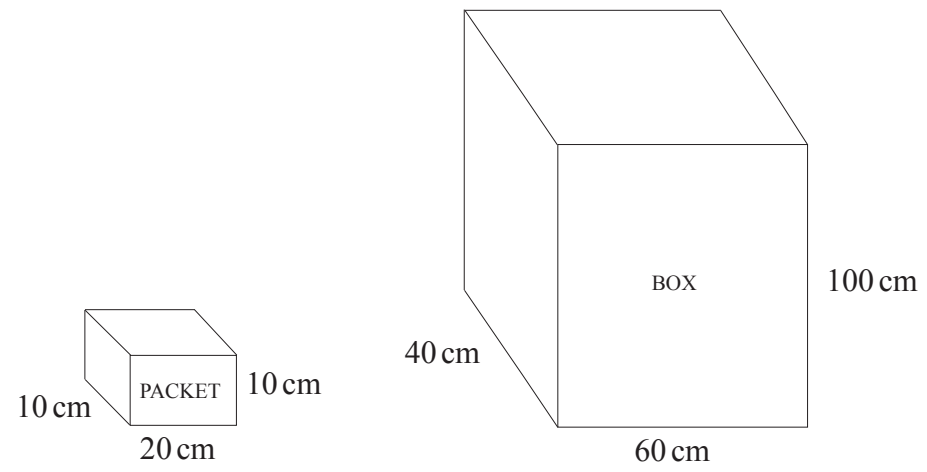
10 cm

20 cm

A packet measures 10 cm by 20 cm by 10 cm.
A box measures 40 cm by 60 cm by 100 cm.
The box is to be completely filled with packets.

Work out the number of packets which can completely fill the box.

...........................................

**(Total 3 marks)**

**Q4**

**Turn over**

**5.** A ream of paper costs £2.69

(a) Work out the cost of 34 reams of paper.

£ ........................................
**(3)**

The weight of a ream of paper is 2.5 kg.
There are 500 sheets of paper in a ream.

(b) Work out the weight, in grams, of one sheet of paper.

...................................... g
**(3)**

**(Total 6 marks)**

N 2 4 9 4 9 A 0 6 2 0

**6.** The diagram shows the position of a farm *F* and a bridge *B* on a map.

**N**

**N**

$\times$ *B*

$\times$

*F*
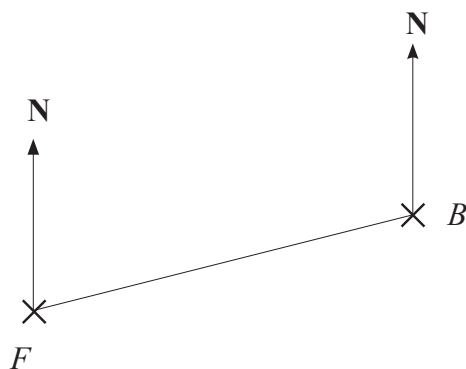
(a) Measure and write down the bearing of *B* from *F*.

.........................................° 

**(1)**

A church *C* is on a bearing of 155° from the bridge *B*.
On the map, the church is 5 cm from *B*.

(b) Mark the church with a cross (x) and label it *C*.

**(2)**

**Q6**

**(Total 3 marks)**

**Turn over**

**7.** Here is a list of ingredients for making fudge for **6** people.

> **Fudge**
>
> Ingredients for **6** people
>
> 600 g   of sugar
> 12 g   of butter
> 480 g   of condensed milk
> 90 m*l* of milk

Work out how much of each ingredient is needed to make fudge for **9** people.

........................................ g of sugar

........................................ g of butter

........................ g of condensed milk

........................................ m*l* of milk

**(Total 3 marks)**

**8.** Jill says

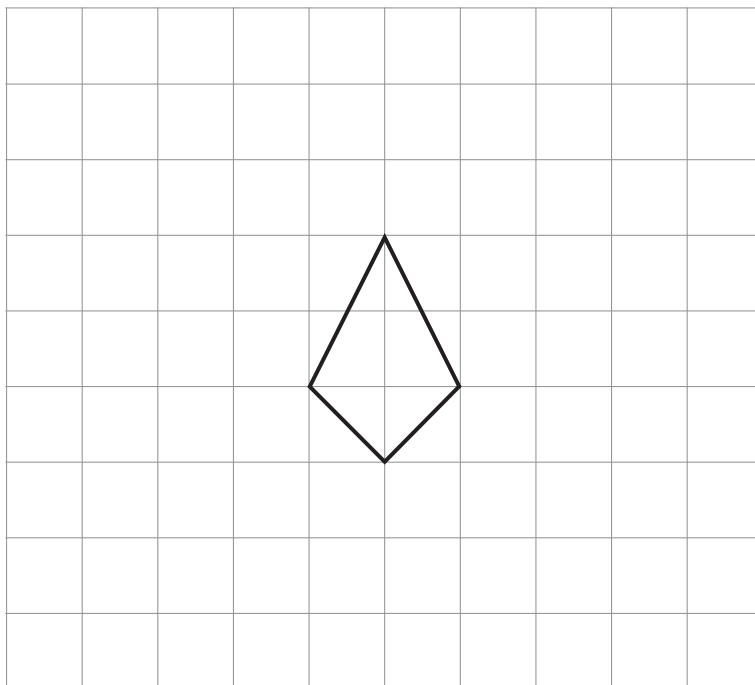"If you multiply any two prime numbers together, the answer will always be an odd number".

Write down an example to show that Jill is **wrong**.

**(Total 2 marks)**

**9.** On the grid, show how this kite will tessellate.
You should draw at least 8 kites.



**Q9**

**(Total 2 marks)**

**10.** Here are the first five terms of a number sequence.

$$3 \qquad 7 \qquad 11 \qquad 15 \qquad 19$$

(a) Work out the 8th term of the number sequence.

..............................................
**(1)**

(b) Write down an expression, in terms of $n$, for the $n$th term of the number sequence.

..............................................
**(2)**   **Q10**

**(Total 3 marks)**

**Turn over**

**11.**

Diagram **NOT** accurately drawn

$2r + 5$

$2r$

$r$

$4r - 3$
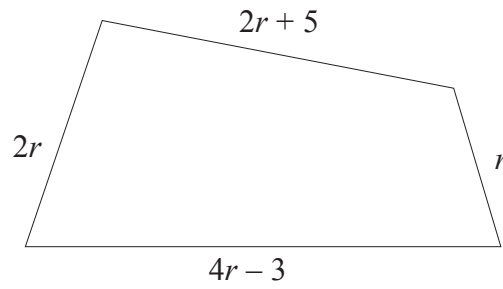
In the diagram, all measurements are in centimetres.

The lengths of the sides of the quadrilateral are

$2r + 5$
$2r$
$4r - 3$
$r$

(a) Find an expression, in terms of $r$, for the perimeter of the quadrilateral.
Give your expression in its simplest form.

.............................................
**(2)**

The perimeter of the quadrilateral is 65 cm.

(b) Work out the value of $r$.
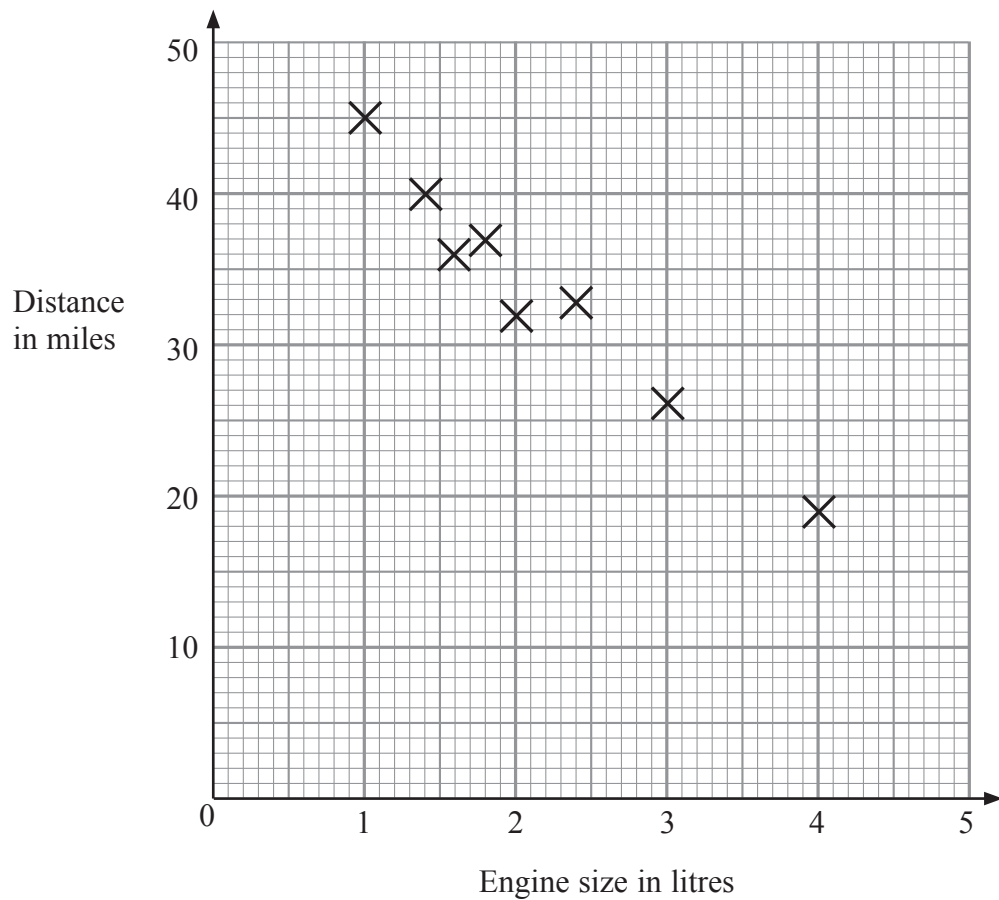
$r =$ .....................................
**(2)**

**(Total 4 marks)**

Q11

**12.** The scatter graph shows some information about 8 cars.
For each car it shows the engine size, in litres, and the distance, in miles, it travels on one gallon of petrol.



Distance in miles (y-axis), Engine size in litres (x-axis)

(a) What type of correlation does this scatter graph show?

..............................................

**(1)**

(b) Draw a line of best fit on the scatter graph.

**(1)**

(c) Use your line of best fit to estimate

(i) the distance travelled on one gallon of petrol by a car with an engine size of 3.5 litres,

............................... miles

(ii) the engine size of a car that travels a distance of 28 miles on one gallon of petrol.

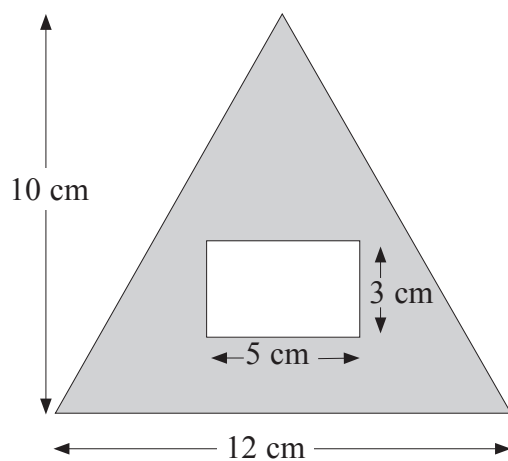........................................ litres

**(2)**

**(Total 4 marks)**

N 2 4 9 4 9 A 0 1 1 2 0

**13.**



Diagram **NOT** accurately drawn

The diagram shows a rectangle inside a triangle.

The triangle has a base of 12 cm and a height of 10 cm.
The rectangle is 5 cm by 3 cm.

Work out the area of the region shown shaded in the diagram.

.................................. cm$^2$

**(Total 3 marks)**

**14.** Mr Brown buys a garden spade.
The spade costs £20 plus 17½% VAT.

(a) Calculate the total cost of the spade.

**Garden spade**

**£20 + 17½% VAT**

£ ........................................

**(3)**

Mr Brown makes some compost.
He mixes soil, manure and leaf mould in the ratio 3:1:1

Mr Brown makes 75 litres of compost.

(b) How many litres of soil does he use?

................................ litres

**(3)**

Mr Brown sows 200 flower seeds.

For each flower seed the probability that it will produce a flower is 0.8

(c) Work out an estimate for the number of these flower seeds that will produce a flower.

..........................................

**(2)**

**Q14**

**(Total 8 marks)**

**15**. Estimate the value of $\dfrac{21 \times 3.86}{0.207}$

................................................ **Q15**

**(Total 3 marks)**

**16.** The density of concrete is 2.3 grams per cm³.

(a) Work out the mass of a piece of concrete with a volume of 20 cm³.

.............................. grams

**(2)**

480 grams of a cheese has a volume of 400 cm³.

(b) Work out the density of the cheese.

.............................. grams per cm³

**(2)** **Q16**

**(Total 4 marks)**

**17.** (a) Solve $\dfrac{y}{4} = 5$

$y =$ ........................................
**(1)**

(b) Factorise $x^2 + 4x$

........................................
**(1)**

(c) Simplify

(i) $m^2 \times m^5$

........................................

(ii) $t^7 \div t^3$

........................................
**(2)**

(d) Expand and simplify $(x + 5)(x + 3)$

........................................
**(2)**

**(Total 6 marks)**

**18.** The table shows some expressions.

| Expression | Length | Area | Volume | None of these |
|---|---|---|---|---|
| $\pi ab$ | | | | |
| $a + 2b$ | | | | |
| $\pi a^2 + b$ | | | | |

The letters $a$ and $b$ represent lengths.
$\pi$ and 2 are numbers that have no dimensions.

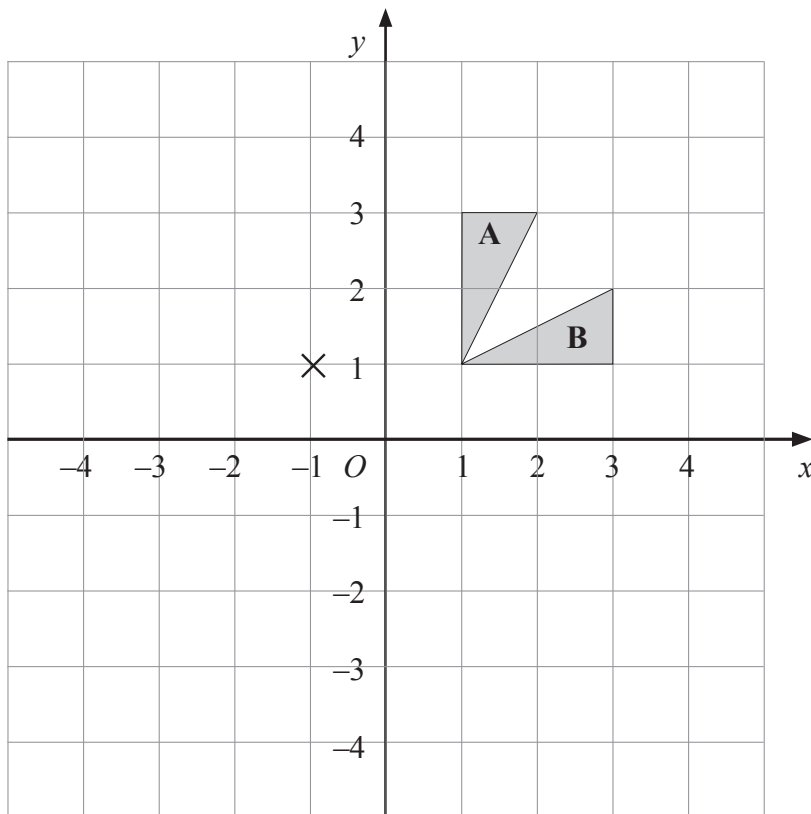Place a tick ($\checkmark$) in the correct column to show whether the expression can be used to represent a length, an area, a volume or none of these.

**(Total 3 marks)**

**Turn over**

**19**.



(a) Describe fully the single transformation that maps triangle **A** onto triangle **B**.

.......................................................................................................................................................

**(2)**

(b) On the grid, rotate triangle **A** 90º anticlockwise about the point (–1, 1)

Label your new triangle **C**.

**(2)** **Q19**

**(Total 4 marks)**

**20**. (a) $-3 \leqslant n < 2$

$n$ is an integer.

Write down all the possible values of $n$.

...........................................

**(2)**

(b) Solve the inequality

$$5x < 2x - 6$$

...........................................

**(2)** **Q20**

**(Total 4 marks)**

**21**. (a) Work out $\dfrac{1}{3} + \dfrac{3}{5}$

.............................................

**(2)**

(b) Work out $2\dfrac{1}{4} \div \dfrac{3}{5}$

.............................................

**(3)**

**(Total 5 marks)**

**22.** Solve the simultaneous equations

$$3x - 4y = 13$$
$$2x + 3y = 3$$

$x =$ ......................................

$y =$ ......................................

**(Total 4 marks)**

**23.** (a) Write $5.7 \times 10^{-4}$ as an ordinary number.

.............................................
**(1)**

(b) Work out the value of $(7 \times 10^4) \times (3 \times 10^5)$

Give your answer in standard form.

.............................................
**(2)**

**(Total 3 marks)**

**24.** The box plot gives information about the distribution of the heights of all the trees in a wood.



Height in metres
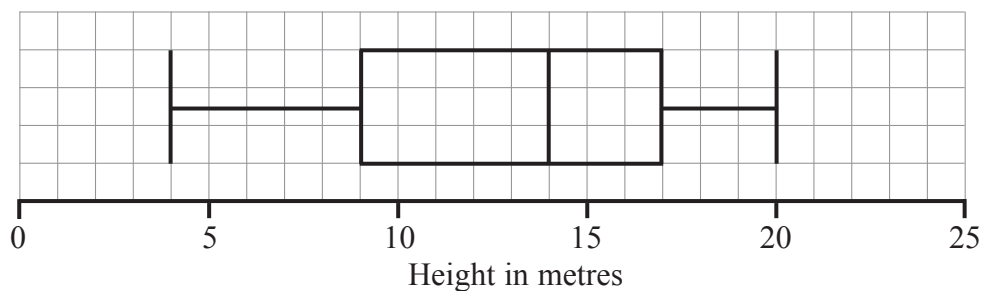
(a) Write down the median height of the trees.

..................................... m
**(1)**

(b) Work out the interquartile range of the heights of the trees.

..................................... m
**(1)**

There are 300 trees in the wood.

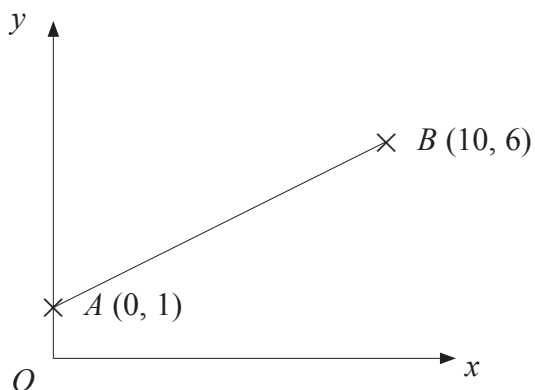(c) Work out the number of trees in the wood with a height of 17 m or more.

.............................................
**(2)**

**(Total 4 marks)**

**25**.

$y$

$\times$ $B$ (10, 6)

Diagram **NOT** accurately drawn

$\times$ $A$ (0, 1)

$O$ ................................ $x$

$A$ is the point (0, 1)
$B$ is the point (10, 6)

(a)  Find the coordinates of the midpoint of $AB$.

(.................... , ....................)
**(2)**

The equation of the straight line through $A$ and $B$ is    $y = \dfrac{1}{2} x + 1$

(b)  Write down the equation of another straight line that is parallel to    $y = \dfrac{1}{2} x + 1$

.............................................
**(1)**

(c)  Write down the equation of another straight line that passes through the point (0, 1)

.............................................
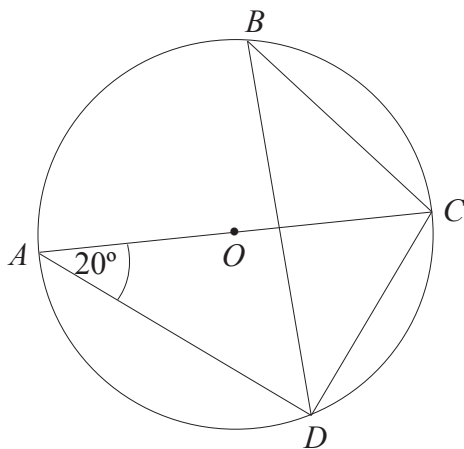**(1)**

**(Total 4 marks)**

Q25

**26.**



Diagram **NOT** accurately drawn

$A$, $B$, $C$ and $D$ are points on the circumference of a circle, centre $O$.
$AC$ is a diameter of the circle.

Angle $DAC = 20º$.

(a)  Find the size of angle $ACD$.

..........................................  º

**(2)**

(b)  Find the size of angle $DBC$.
Give a reason for your answer.

..........................................  º

.........................................................................................................................................

.........................................................................................................................................

**(2)**

Q26

**(Total 4 marks)**

**TOTAL FOR PAPER: 100 MARKS**

**END**