6 a
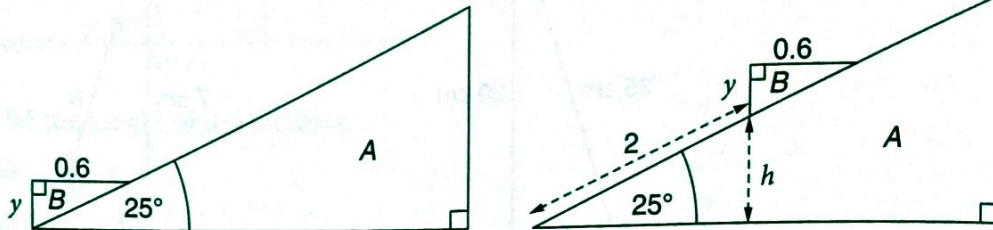

The diagram shows a solid triangular prism. The dimensions are in metres.
i Calculate the volume of the prism.
ii Calculate the total surface area of the prism (Unit for answer: m^3).

b

The diagrams show the cross-sections of a ramp A and a triangular prism B.
The triangular prism B can move up and down the ramp A.
The ramp is inclined at 25° to the horizontal.
i When the prism has moved 2 m up the ramp, it has risen h metres vertically.
Calculate h.
ii As it moves, the uppermost face of the prism B remains horizontal.
The length of the horizontal edge of the face is 0.6 m.
The length of the vertical edge of the prism is y metres.
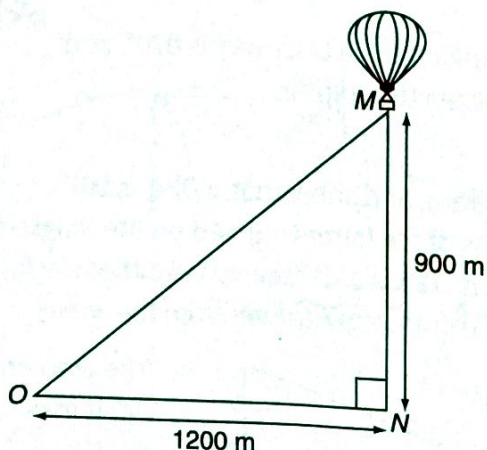Calculate y.

(4024 paper 22 Q4 November 2014)

7

NOT TO SCALE
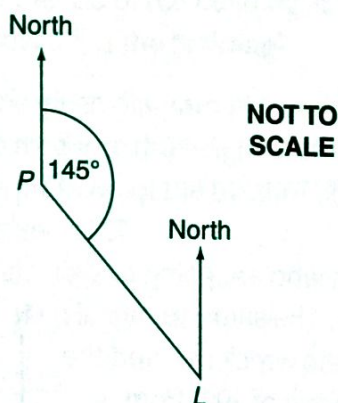
The bearing of a lighthouse, L, from a port, P, is 145°.
Find the bearing of P from L.

(0580 paper 01 Q7 June 2007)

8

NOT TO SCALE

A hot air balloon, M, is 900 metres vertically above a point N on the ground.

A boy stands at a point, O, 1200 metres horizontally from N.
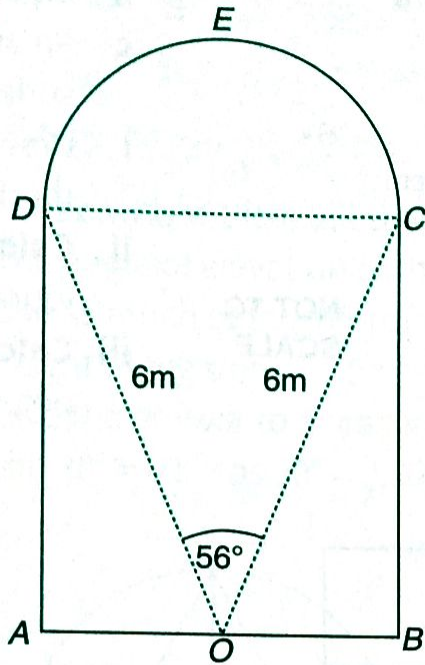**a** Calculate the distance, OM, of the boy from the balloon.
b Calculate angle MON.

(0580 paper 01 Q18 June 2007)

9 Write as a 3-figure bearing the direction:
   a West
      North-East.

10
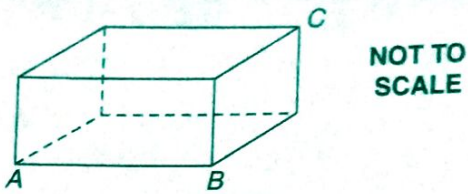

NOT TO SCALE

ABCED is the cross-section of a tunnel.
ABCD is a rectangle and *DEC* is a semicircle. *O* is the midpoint of *AB*.
$OD = OC = 6$ m and angle $DOC = 56°$.

  a **i** Show that angle $COB = 62°$.
     ii Calculate the length of *OB*.
    iii Write down the width of the tunnel, *AB*.
    iv Calculate the length of *BC*.

  b Calculate the area of:
    i the rectangle *ABCD*
    ii the semicircle *DEC*
   iii the cross-section of the tunnel.

  c The tunnel is 500 metres long.
    i Calculate the volume of the tunnel.
    ii A car travels through the tunnel at a constant speed
      of 60 kilometres per hour.
      How many seconds does it take to go through
      the tunnel?

11


NOT TO SCALE

6 cm

4 cm

C

NOT TO SCALE

A   B

8 cm
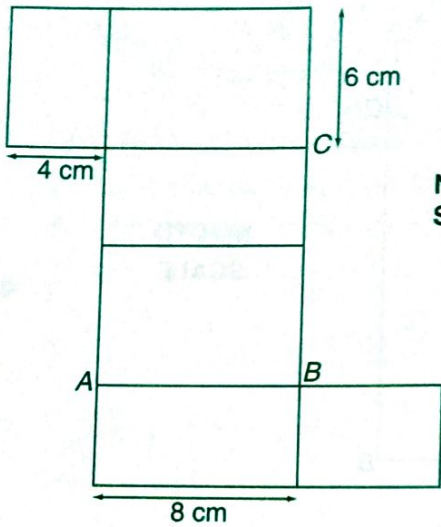
The diagram above shows a cuboid and its net.

a Calculate the total surface area of the cuboid.

b Calculate the volume of the cuboid.

c An ant walks directly from A to C on the surface of the cuboid.

i Draw a straight line on the net to show this route.

ii **Calculate** the length of the ant's journey.

iii **Calculate** the size of angle CAB on the net.   (0580 paper 03 Q8 June 2005)

Exam-style questions Part 2

DO NOT USE A CALCULATOR IN THE REST OF THIS EXERCISE

12
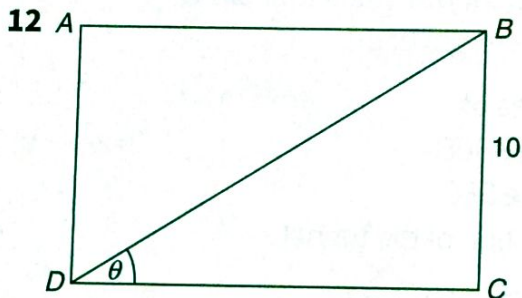
$\sin \theta$	$\frac{5}{13}$
$\cos \theta$	$\frac{12}{13}$
$\tan \theta$	$\frac{5}{12}$

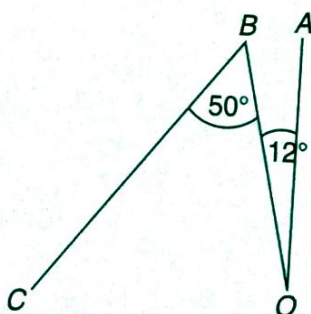ABCD is a rectangle with BC = 10 cm.
Using as much information from the table as is necessary, calculate BD.

(4024 paper 01 Q6 June 2008)

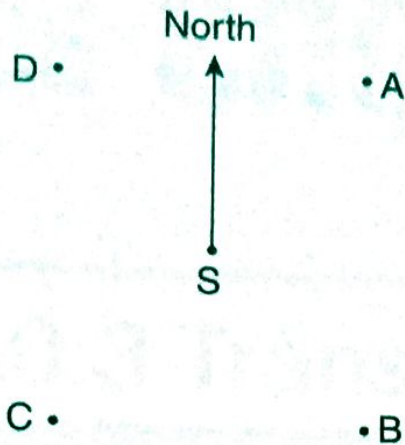**13** A is due north of O.

a A ship sailed from O to B, where $A\hat{O}B = 12°$.
Write down the bearing of B from O.

b At B, the ship turned and sailed to C, where $O\hat{B}C = 50°$.
Calculate the bearing of C from B.

(4024 paper 01 Q4 June 2005)

14

North

D •

• A

S

C •

• B

The bearing of a lighthouse from a ship, S, is 220°.
The position of S is marked on the diagram.

a Which of the four points A, B, C or D is a possible position of the lighthouse?

b Write down the bearing of S from the lighthouse.

15 A man who is 1.8 m tall stands on horizontal ground 50 m from a vertical tree.
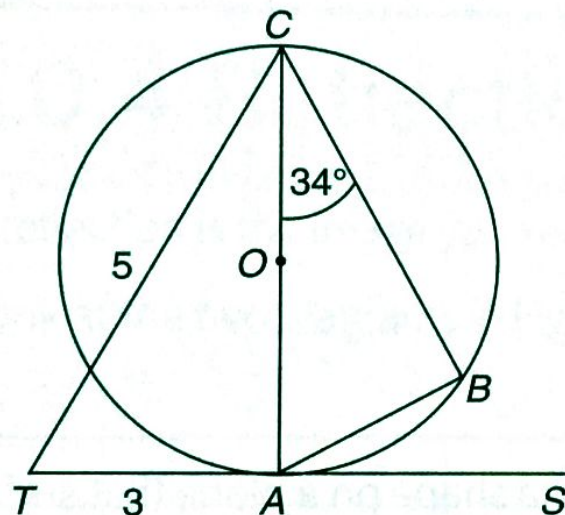The angle of elevation of the top of the tree from his eyes is 30°.
Use as much of the information below as is necessary to calculate an estimate of the height of the tree.
Give the answer to a reasonable degree of accuracy.
[sin 30° = 0.5, cos 30° = 0.866, tan 30° = 0.577]

16

In the diagram, the circle, centre O, passes through A, B and C.

AC is a diameter of the circle and the line TAS is the tangent at A.

$\angle ACB = 34°$, TA = 3 cm and TC = 5 cm.

a Find $\angle BAC$.

b Calculate the radius of the circle.

6 **a i** $105m^3$ **ii** $197m^2$

   b i 0.845 **ii** 0.280

7 $325°$

8 **a** $1500 m$ **b** $36.9°$

9 **a** $270°$ **b** $045°$

10 a i $\angle COB = \frac{1}{2}(180 - 56) = 62$

    ii 2.82 m   **iii** 5.63 or 5.64 m   **iv** 5.30 m

  b i 29.8 or 29.9 m²   **ii** 12.5 m²

    iii 42.3 or 42.4 m²

  c i 21100 or 21200 m³   **ii** 30

11 a 208 cm²   **b** 192 cm³

  c ii 12.8 cm   **iii** 51.3 or 51.4°

12 26 cm

13 a 348°   **b** 218°

14 a C   **b** 40°

15 31 m

16 a 56°   **b** 2 cm