Chapter 6

Trigonometry

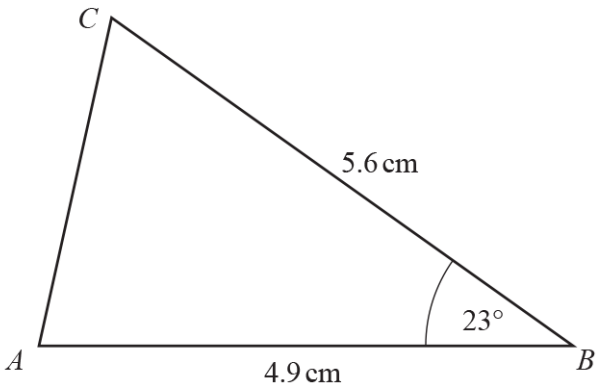
01. 0580_m24_qp_22 Q: 13

The bearing of B from A is 107°.

Calculate the bearing of A from B.

..... [2]

02. 0580_m24_qp_22 Q: 20



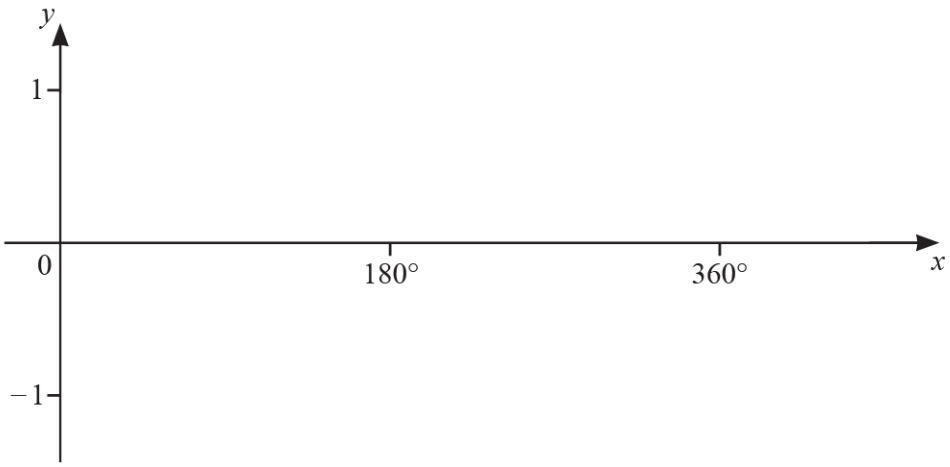
NOT TO SCALE

Calculate the area of triangle ABC.

..... cm^2 [2]

03. 0580_m24_qp_22 Q: 23

(a) On the axes, sketch the graph of $y = \cos x$, for $0° \leqslant x \leqslant 360°$.

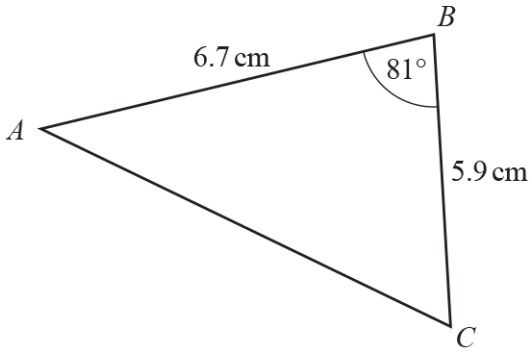


[2]

(b) Solve the equation $\cos x = 0.294$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... or $x =$ ..... [2]

04. 0580_s24_qp_21 Q: 17



NOT TO SCALE

Calculate the area of triangle ABC.

..... cm^2 [2]

---

05. 0580_s24_qp_21 Q: 20

Solve the equation $8\sin x + 6 = 1$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... or $x =$ ..... [3]

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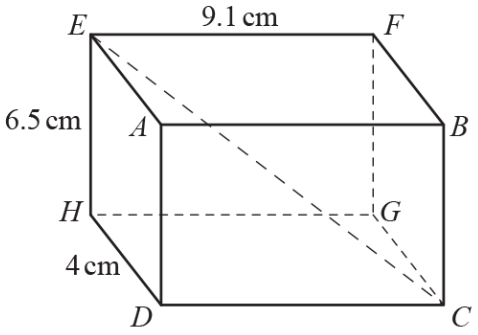
06. 0580_s24_qp_21 Q: 21



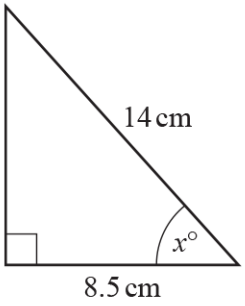
NOT TO SCALE

The diagram shows a cuboid.
$HD = 4$ cm, $EH = 6.5$ cm and $EF = 9.1$ cm.

Calculate the angle between CE and the base $CDHG$.

..... [4]

07. 0580_s24_qp_22 Q: 12



NOT TO SCALE

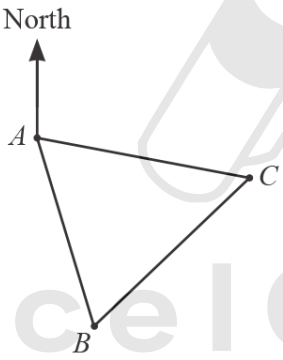
The diagram shows a right-angled triangle.

Calculate the value of x.

$x =$ ..... [2]

---

08. 0580_s24_qp_22 Q: 15



NOT TO SCALE

Three towns, A, B and C, are equidistant from each other.
The bearing of C from A is 104°.

Calculate the bearing of B from C.

..... [3]

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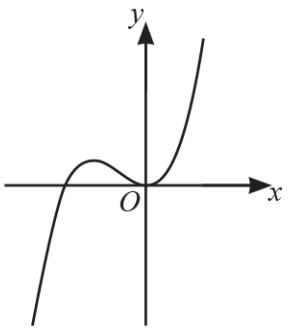
09. 0580_s24_qp_22 Q: 22

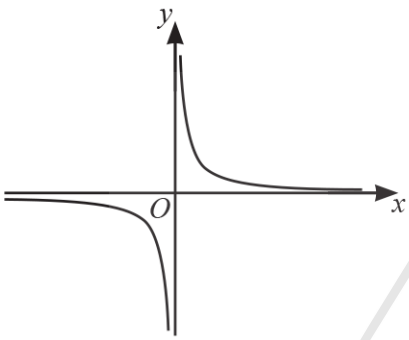
(a) For each sketch, put a ring around the correct type of function shown.

(i)



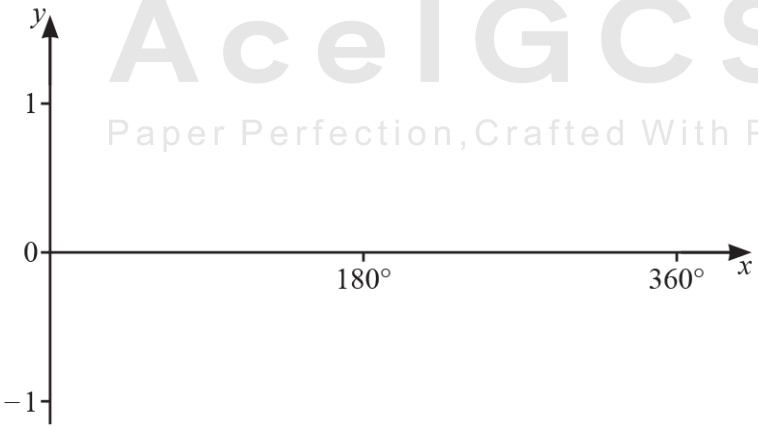
linear cubic quadratic reciprocal exponential [1]

(ii)



linear cubic quadratic reciprocal exponential [1]

(b) **(i)** On the grid, sketch the curve $y = \sin x$ for $0° \leqslant x \leqslant 360°$.

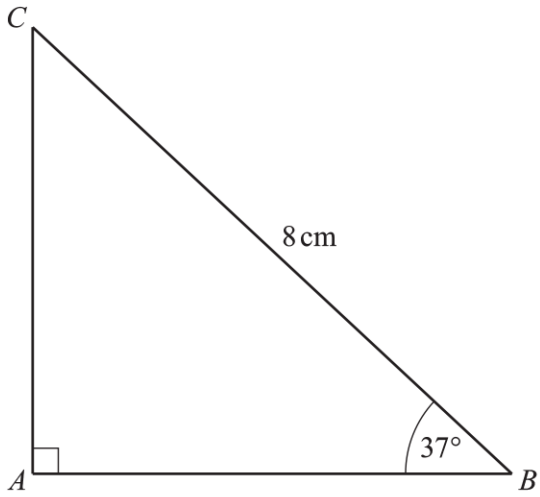


[2]

(ii) Solve the equation $\sin x + 0.4 = 0$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... or $x =$ ..... [3]

10. 0580_s24_qp_23 Q: 9



NOT TO SCALE

The diagram shows a right-angled triangle.

Calculate AB.

$AB =$ ..... cm [2]

---

11. 0580_s24_qp_23 Q: 22

Solve the equation $\tan x + \sqrt{3} = 0$ for $0° \leqslant x \leqslant 360°$.

..... [3]

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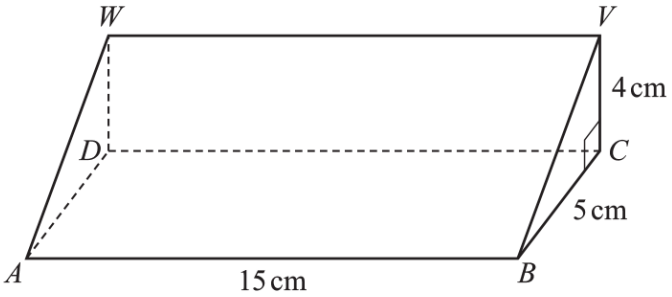
12. 0580_s24_qp_23 Q: 24



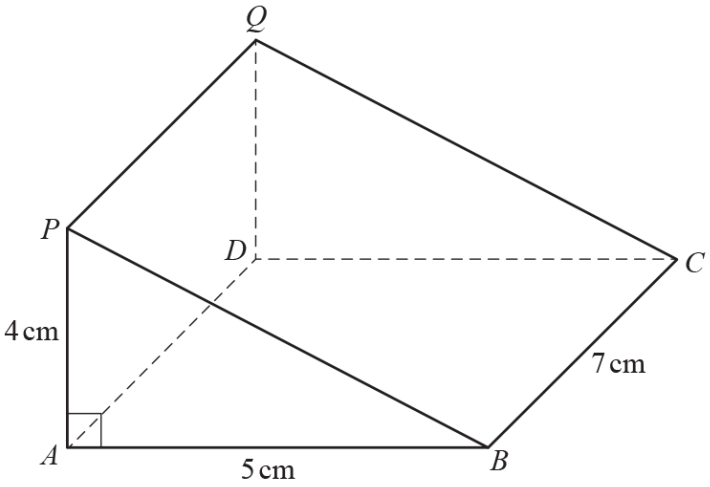
NOT TO SCALE

The diagram shows a triangular prism with cross-section triangle BCV.
Angle $BCV = 90°$, $BC = 5\text{cm}$, $CV = 4\text{cm}$ and $AB = 15\text{cm}$.

Calculate the angle between AV and the base $ABCD$.

..... [4]

13. 0580_m23_qp_22 Q: 22



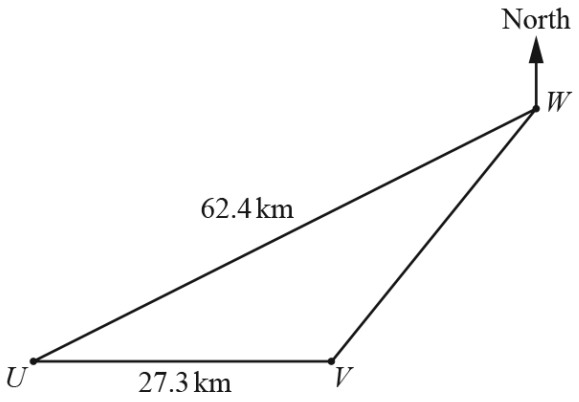
NOT TO SCALE

The diagram shows a triangular prism $ABCDQP$ of length 7 cm.
The cross-section is triangle PAB with $PA = 4$ cm, $AB = 5$ cm and angle $PAB = 90°$.

Calculate the angle between the line PC and the base $ABCD$.

..... [4]

14. 0580_s23_qp_21 Q: 18



NOT TO SCALE

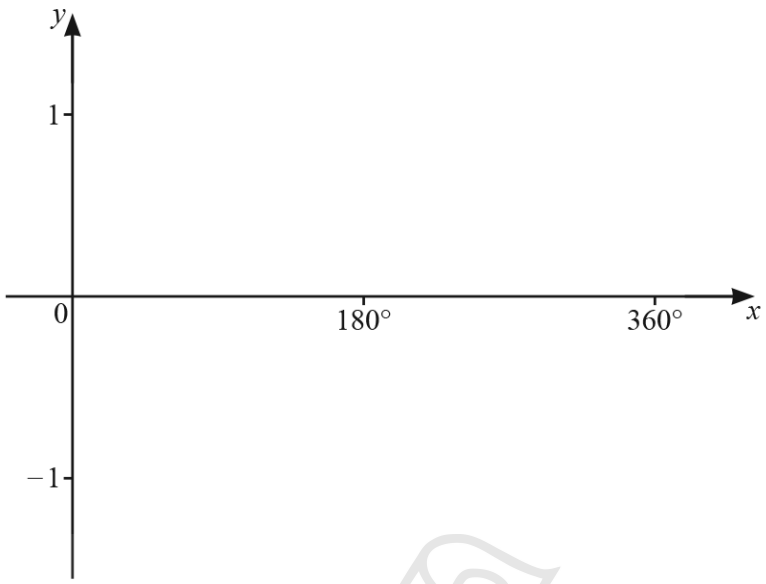
The diagram shows the position of three towns, U, V and W.
U is due west of V and angle $UVW = 125°$.

Calculate the bearing of U from W.

..... [4]

15. 0580_s23_qp_21 Q: 19

(a) On the diagram, sketch the graph of $y = \cos x$ for $0° \leqslant x \leqslant 360°$.

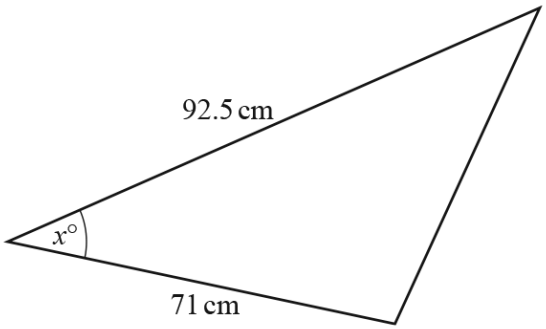


[2]

(b) Solve the equation $5\cos x + 3 = 0$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... or $x =$ ..... [3]

16. 0580_s23_qp_22 Q: 17



NOT TO SCALE

The diagram shows a triangle with an acute angle marked $x°$.
The area of the triangle is $2143\,\text{cm}^2$.

Work out the value of x.

$x =$ ..... [2]

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17. 0580_s23_qp_22 Q: 21

Solve the equation $5\sin x = -3$ for $0° \leqslant x \leqslant 360°$.

..... [3]

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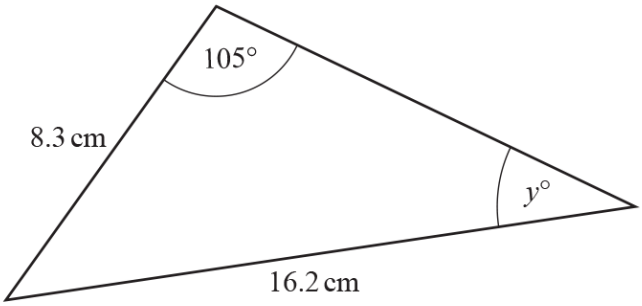
18. 0580_w23_qp_21 Q: 18



NOT TO SCALE

Calculate the value of y.

$y =$ ..... [3]

19. 0580_w23_qp_21 Q: 19

(a)

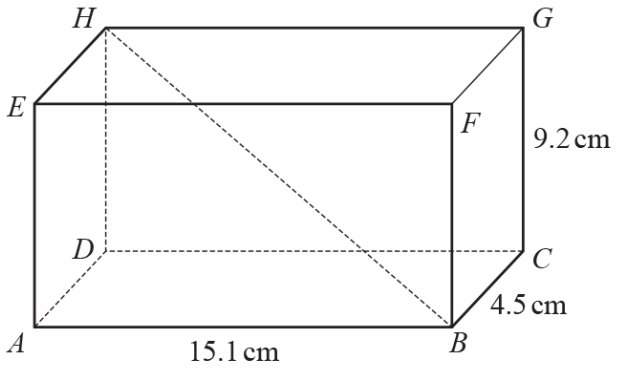
Sketch the graph of $y = \cos x$ for $0° \leqslant x \leqslant 360°$.

[2]

(b) When $\cos x = 0.21$, find the **reflex** angle x.

..... [2]

20. 0580_w23_qp_21 Q: 21



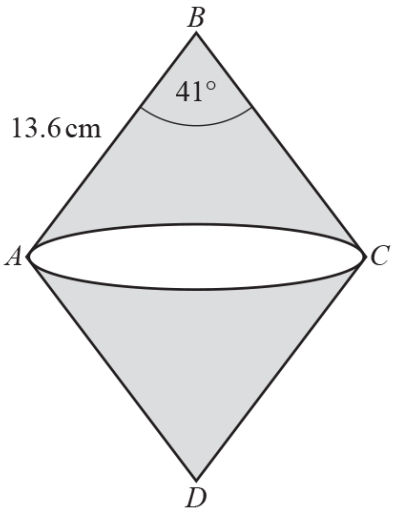
NOT TO SCALE

The diagram shows a cuboid $ABCDEFGH$.
$AB = 15.1$ cm, $BC = 4.5$ cm and $CG = 9.2$ cm.

Calculate the angle that the diagonal BH makes with the face $ADHE$.

..... [4]

21. 0580_w23_qp_21 Q: 22



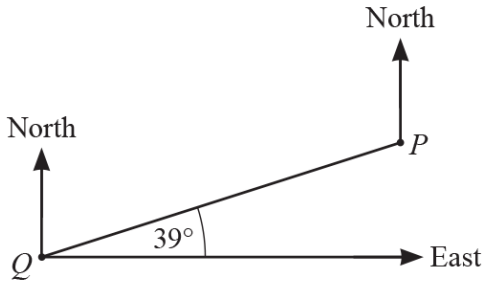
NOT TO SCALE

ABCD is a rhombus with side length 13.6 cm.
Angle *ABC* = 41°.
BAC is a sector of a circle with centre *B*.
DAC is a sector of a circle with centre *D*.

Calculate the shaded area.

..... cm^2 [4]

22. 0580_w23_qp_22 Q: 7



NOT TO SCALE

Find the bearing of Q from P.

..... [2]

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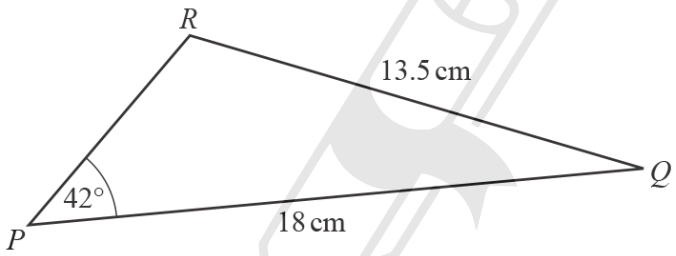
23. 0580_w23_qp_23 Q: 19



NOT TO SCALE

Calculate the obtuse angle PRQ.

Angle PRQ = ... [4]

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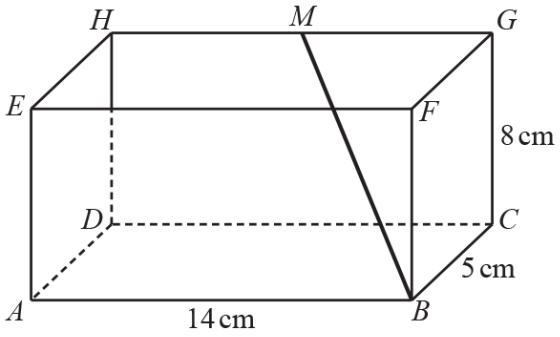
24. 0580_w23_qp_23 Q: 21



NOT TO SCALE

The diagram shows a cuboid $ABCDEFGH$.
$AB = 14$ cm, $BC = 5$ cm and $CG = 8$ cm.
M is the midpoint of HG.

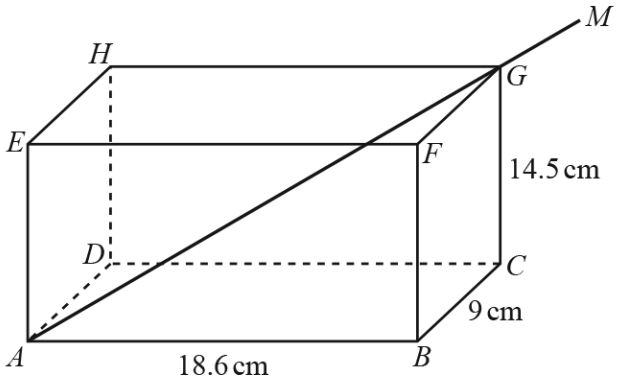
(a) Calculate BM.

..... cm [3]

(b) Calculate the angle that BM makes with the base $ABCD$.

..... [3]

25. 0580_m22_qp_22 Q: 21



NOT TO SCALE

The diagram shows an open rectangular box $ABCDEFGH$.
$AB = 18.6$ cm, $BC = 9$ cm and $CG = 14.5$ cm.
A straight stick AGM rests against A and G and extends outside the box to M.

(a) Calculate the angle between the stick and the base of the box.

..... [4]

(b) $AM = 30$ cm.

Show that $GM = 4.8$ cm, correct to 1 decimal place.

[3]

26. 0580_s22_qp_21 Q: 24

A cuboid measures 24 cm by 12 cm by 8 cm.

Calculate the length of a diagonal of the cuboid.

..... cm [3]

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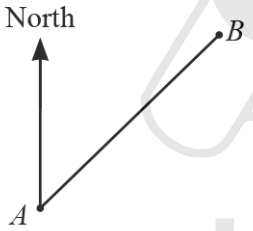
27. 0580_s22_qp_22 Q: 9



NOT TO SCALE

The bearing of B from A is 059°.

Work out the bearing of A from B.

..... [2]

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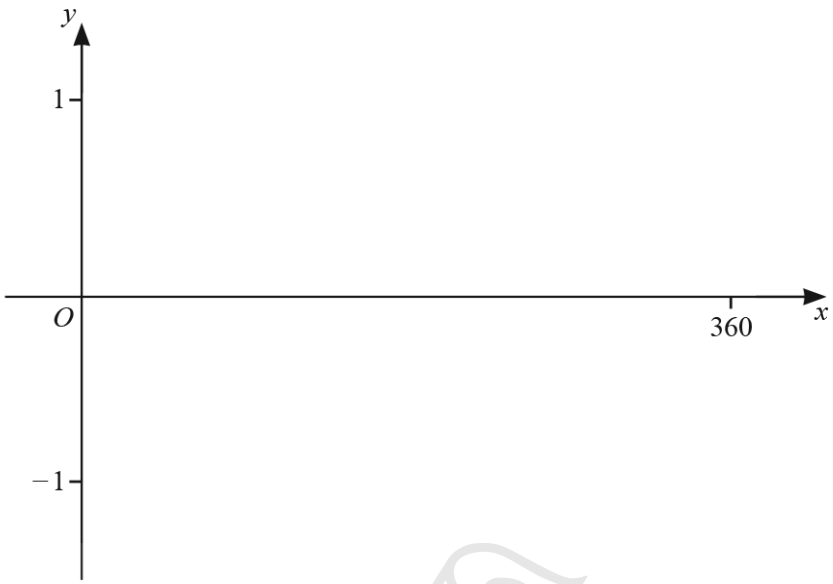
28. 0580_s22_qp_22 Q: 17

(a) Sketch the graph of $y = \sin x$ for $0° \leqslant x \leqslant 360°$.



[2]

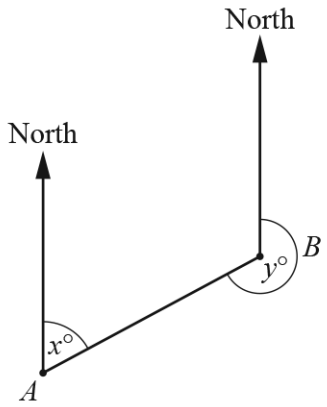
(b) Solve the equation $3\sin x + 1 = 0$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... or $x =$ ..... [3]

29. 0580_s22_qp_23 Q: 18

The bearing of B from A is $x°$.
The bearing of A from B is $y°$.
$x : y = 2 : 7$

Calculate the value of y.



NOT TO
SCALE

$y =$ ..... [3]

30. 0580_s22_qp_23 Q: 23

Solve the equation $3\sin x + 3 = 1$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... or $x =$ ..... [3]

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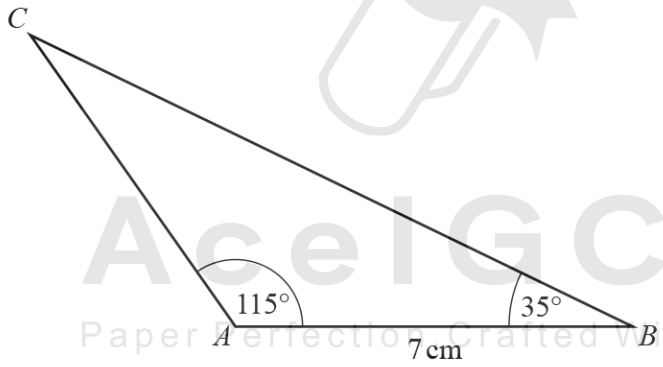
31. 0580_w22_qp_21 Q: 18



NOT TO SCALE

Calculate the length BC.

$BC =$ ..... cm [4]

---

32. 0580_w22_qp_21 Q: 22

(a) On the diagram, sketch the graph of $y = \cos x$ for $0° \leqslant x \leqslant 360°$. [2]

(b) Solve the equation $\cos x = -\frac{1}{2}$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... or $x =$ ..... [2]

33. 0580_w22_qp_22 Q: 10

Calculate.

(a) 2000×1.2^3

..... [1]

(b) $2\frac{1}{8} \times \frac{6}{17}$

..... [1]

(c) $\frac{4.5(\cos 30°)}{\sqrt{3}} - 2$

..... [1]

34. 0580_w22_qp_23 Q: 20

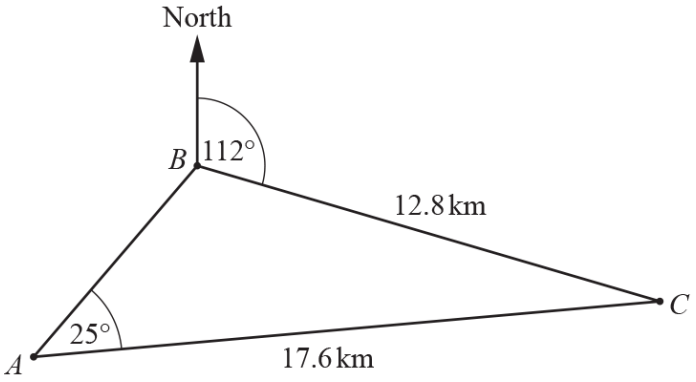
(a)

Sketch the graph of $y = \sin x$ for $0° \leqslant x \leqslant 360°$. [2]

(b) Solve $3 - 2\sin x = \frac{13}{4}$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... or $x =$ ..... [3]

35. 0580_w22_qp_23 Q: 21



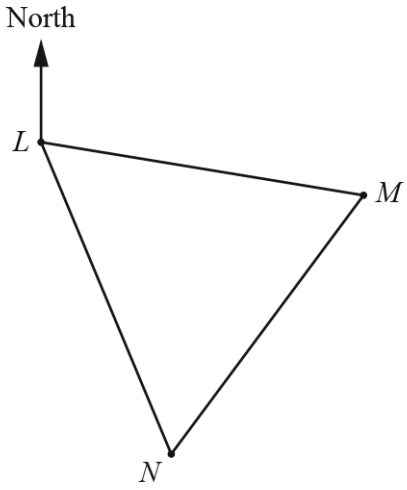
NOT TO SCALE

The diagram shows the positions of three ships A, B and C.
$AC = 17.6$ km, $BC = 12.8$ km and angle $BAC = 25°$.
The bearing of C from B is 112° and angle ABC is obtuse.

Calculate the bearing of B from A.

..... [5]

36. 0580_m21_qp_22 Q: 10



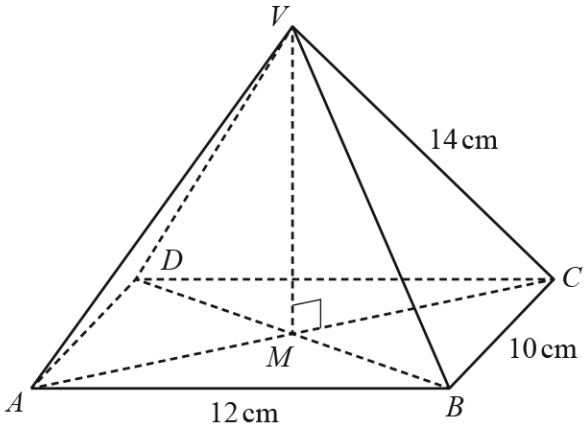
NOT TO SCALE

On a map, the positions of the towns L, M and N form an equilateral triangle.
The bearing of M from L is 103°.

Work out the bearing of L from N.

..... [2]

37. 0580_m21_qp_22 Q: 23



NOT TO SCALE

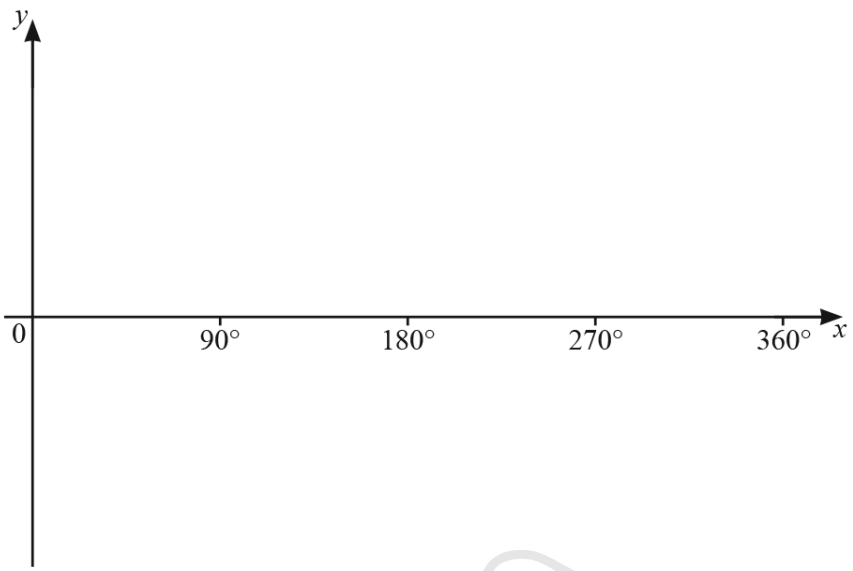
The diagram shows a pyramid $VABCD$ with a rectangular base.
V is vertically above M, the intersection of the diagonals AC and BD.
$AB = 12$ cm, $BC = 10$ cm and $VC = 14$ cm.

Calculate the angle that VC makes with the base $ABCD$.

..... [4]

38. 0580_s21_qp_21 Q: 19

(a) Sketch the graph of $y = \tan x$ for $0° \leqslant x \leqslant 360°$.

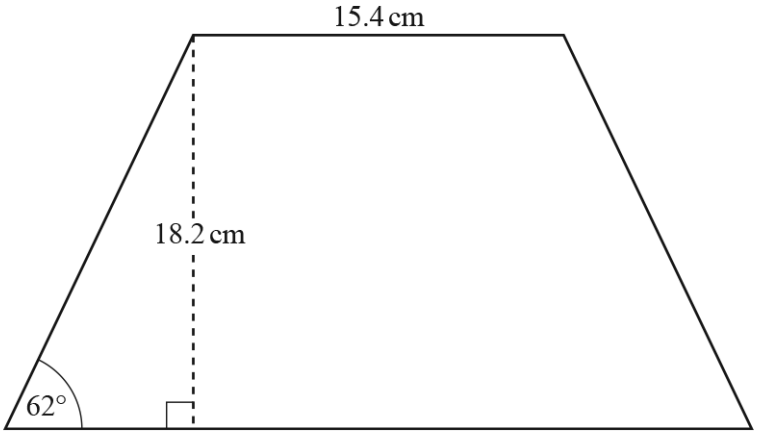


[2]

(b) Solve the equation $5\tan x = 1$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... or $x =$ ..... [2]

39. 0580_s21_qp_22 Q: 14



NOT TO SCALE

The diagram shows a trapezium.
The trapezium has one line of symmetry.

Work out the area of the trapezium.

..... cm^2 [4]

40. 0580_s21_qp_22 Q: 23

Find all the solutions of $4\sin x = 3$ for $0° \leqslant x \leqslant 360°$.

..... [2]

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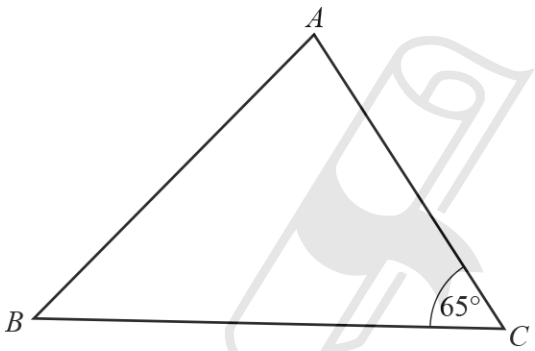
41. 0580_s21_qp_23 Q: 21



NOT TO SCALE

The shortest distance from B to AC is 12.8 cm.

Calculate BC.

$BC =$ ..... cm [3]

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42. 0580_s21_qp_23 Q: 23

A triangle has sides of length 11 cm, 10 cm and 9 cm.

Calculate the largest angle in the triangle.

..... [4]

43. 0580_w21_qp_21 Q: 6

The scale drawing shows the positions of two towns, P and Q.
The scale is 1 cm represents 4 km.

Scale: 1 cm to 4 km

(a) Find the actual distance between town P and town Q.

..... km [2]

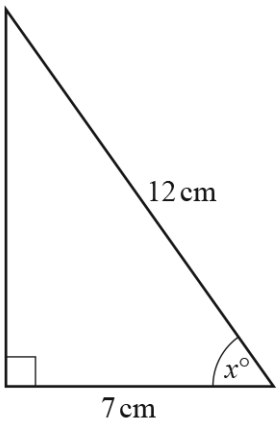
(b) Measure the bearing of town Q from town P.

..... [1]

(c) Town X is 28 km from town P on a bearing of 140°.

On the scale drawing, mark the position of town X. [2]

44. 0580_w21_qp_21 Q: 9

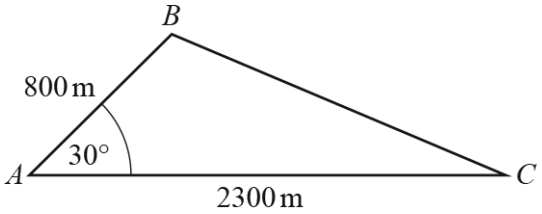


NOT TO SCALE

Calculate the value of x.

$x =$ ..... [2]

45. 0580_w21_qp_21 Q: 18



NOT TO SCALE

The diagram shows some land in the shape of a triangle ABC.
Houses are built on this land.
Each house requires $400\,m^2$ of land.

Find the greatest number of houses that can be built on this land.

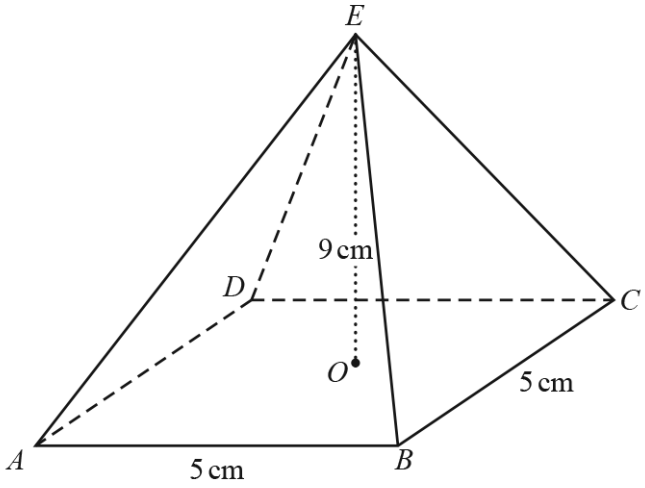
..... [3]

46. 0580_w21_qp_21 Q: 20

Solve $3(2+\cos x) = 5$ for $0° \leqslant x \leqslant 360°$.

..... [3]

47. 0580_w21_qp_21 Q: 21



NOT TO SCALE

The diagram shows a pyramid $ABCDE$.
The pyramid has a square horizontal base $ABCD$ with side 5 cm.
The vertex E is vertically above the centre O of the base.
The height OE of the pyramid is 9 cm.

Calculate the angle that EC makes with the base $ABCD$.

..... [4]

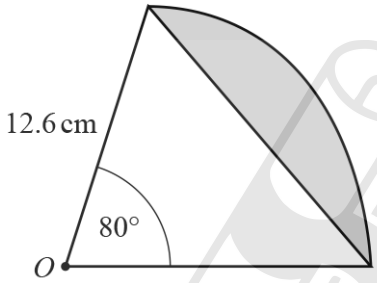
48. 0580_w21_qp_22 Q: 22

Solve the equation $7\sin x + 2 = 0$ for $0° \leqslant x \leqslant 360°$.

..... [3]

---

49. 0580_w21_qp_23 Q: 19



NOT TO SCALE

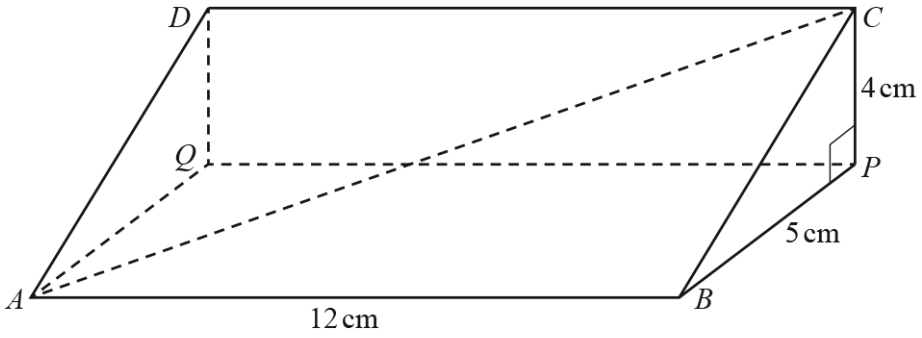
The diagram shows a sector of a circle, centre O, radius 12.6 cm.

Calculate the perimeter of the shaded segment.

..... cm [4]

---

50. 0580_w21_qp_23 Q: 23



NOT TO SCALE

The diagram shows a triangular prism.
Angle $BPC = 90°$.

(a) Calculate AC.

$AC =$ ..... cm [3]

(b) Calculate the angle between AC and the base $ABPQ$.

..... [3]

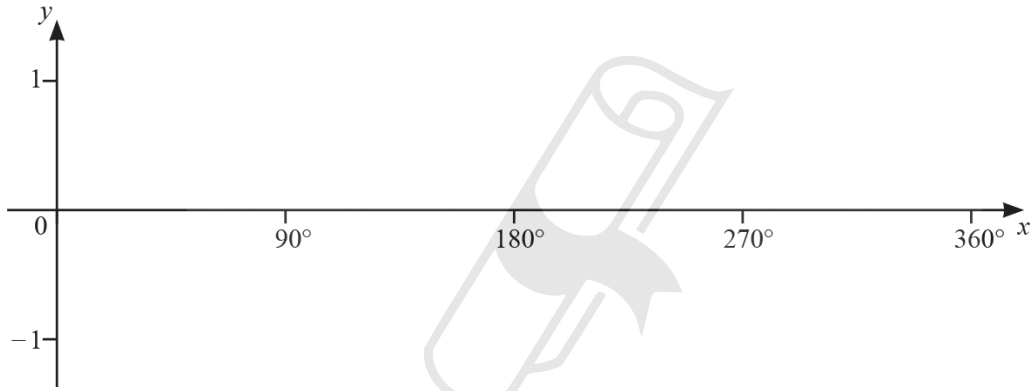
51. 0580_w21_qp_23 Q: 24

$\tan x = \sqrt{3}$ and $0° \leqslant x \leqslant 360°$.

Find all the possible values of x.

..... [2]

52. 0580_m20_QP_22 Q: 19

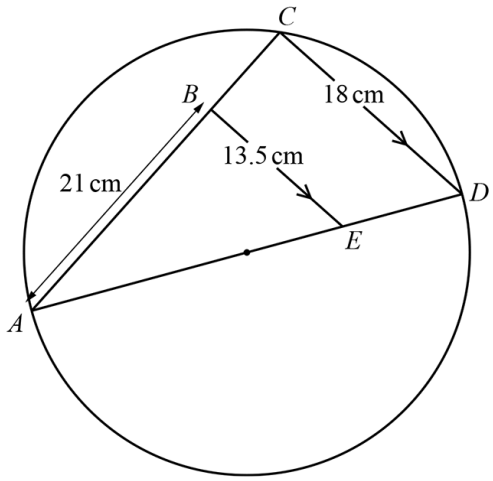


(a) On the diagram, sketch the graph of $y = \cos x$ for $0° \leqslant x \leqslant 360°$. [2]

(b) Solve the equation $4\cos x + 2 = 3$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... and $x =$ ..... [3]

53. 0580_s20_QP_21 Q: 13



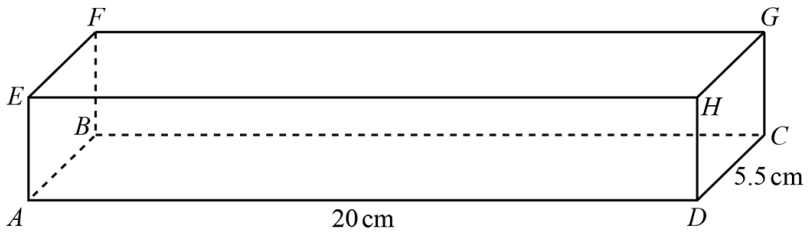
NOT TO SCALE

C lies on a circle with diameter AD.
B lies on AC and E lies on AD such that BE is parallel to CD.
$AB = 21$ cm, $CD = 18$ cm and $BE = 13.5$ cm.

Work out the radius of the circle.

..... cm [5]

54. 0580_s20_QP_21 Q: 19



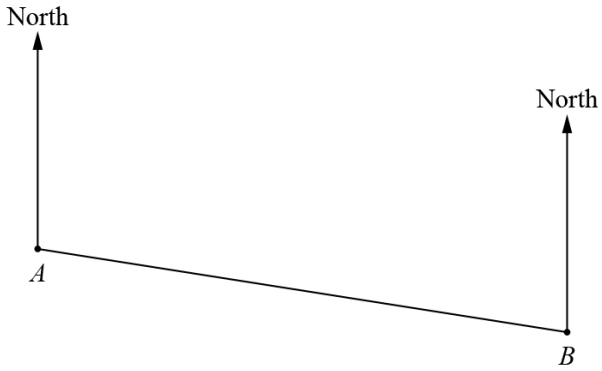
NOT TO SCALE

The diagram shows cuboid $ABCDEFGH$ of length 20 cm and width 5.5 cm.
The volume of the cuboid is $495\,\text{cm}^3$.

Find the angle between the line AG and the base of the cuboid $ABCD$.

..... [5]

55. 0580_s20_QP_22 Q: 9



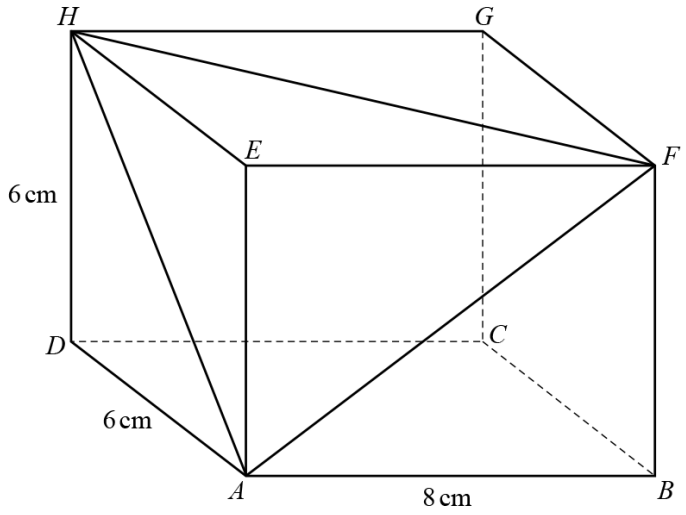
NOT TO SCALE

The bearing of B from A is 105°.

Find the bearing of A from B.

..... [2]

56. 0580_s20_QP_22 Q: 27



NOT TO SCALE

The diagram shows a cuboid.
$AB = 8\,\text{cm}$, $AD = 6\,\text{cm}$ and $DH = 6\,\text{cm}$.

Calculate angle HAF.

Angle HAF = ... [6]

57. 0580_s20_QP_23 Q: 8

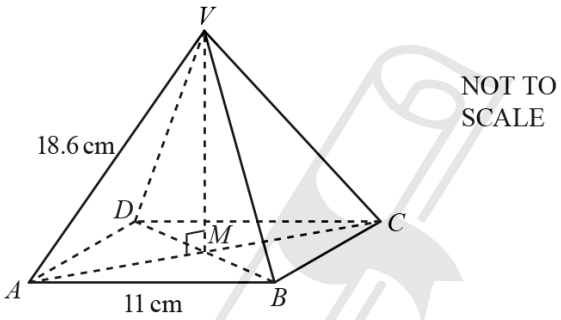
The bearing of X from Y is 274°.

Calculate the bearing of Y from X.

..... [2]

---

58. 0580_s20_QP_23 Q: 20



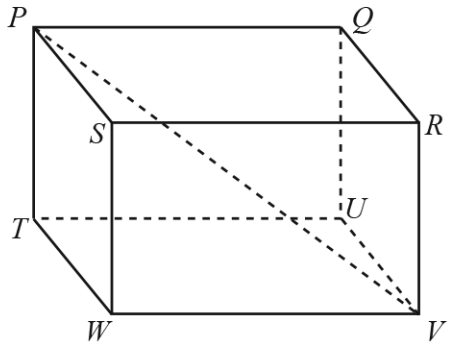
The diagram shows a pyramid with a square base $ABCD$.
The diagonals AC and BD intersect at M.
The vertex V is vertically above M.
$AB = 11$ cm and $AV = 18.6$ cm.

Calculate the angle that AV makes with the base.

..... [4]

---

59. 0580_w20_qp_21 Q: 21



NOT TO SCALE

The diagram shows a cuboid $PQRSTUVW$.
$PV = 17.2$ cm
The angle between the line PV and the base $TUVW$ of the cuboid is 43°.

Calculate PT.

$PT =$ ..... cm [3]

---

60. 0580_w20_qp_22 Q: 13

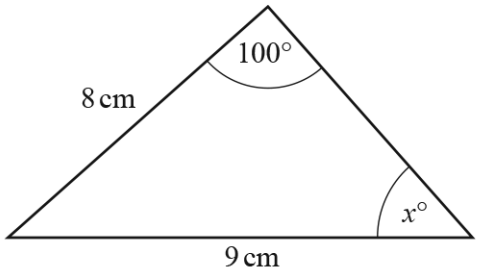
The length of one side of a rectangle is 12 cm.
The length of the diagonal of the rectangle is 13 cm.

Calculate the area of the rectangle.

..... cm^2 [3]

---

61. 0580_w20_qp_22 Q: 19



NOT TO SCALE

(a) Calculate the value of x.

$x =$ ..... [3]

(b) Calculate the area of the triangle.

..... cm^2 [3]

---

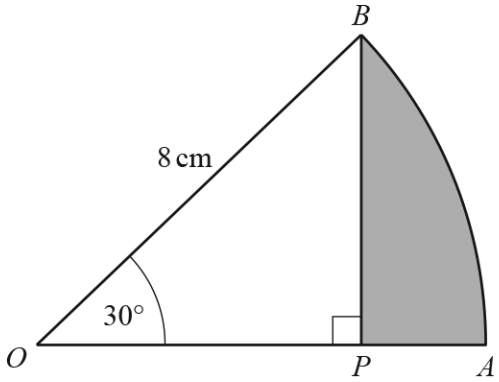
62. 0580_w20_qp_22 Q: 25

Solve the equation $\tan x = 2$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... or $x =$ ..... [2]

---

63. 0580_w20_qp_23 Q: 21



NOT TO SCALE

OAB is the sector of a circle, centre O.
$OB = 8$ cm and angle $AOB = 30°$.
BP is perpendicular to OA.

(a) Calculate AP.

$AP =$ ..... cm [3]

(b) Work out the area of the shaded region APB.

..... cm^2 [3]

64. 0580_w20_qp_23 Q: 25

Solve $3\tan x = -4$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... or $x =$ ..... [3]

---

65. 0580_m19_QP_22 Q: 7

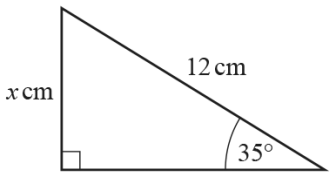
The bearing of Alexandria from Paris is 128°.

Calculate the bearing of Paris from Alexandria.

..... [2]

---

66. 0580_s19_QP_21 Q: 7



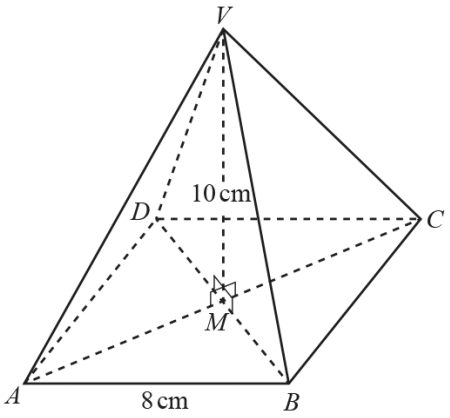
NOT TO SCALE

The diagram shows a right-angled triangle.

Calculate the value of x.

$x =$ ..... [2]

67. 0580_s19_QP_21 Q: 21



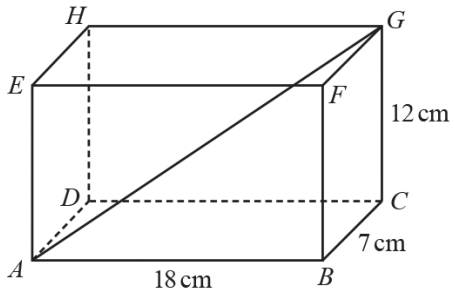
NOT TO SCALE

The diagram shows a pyramid with a square base $ABCD$ of side length 8 cm.
The diagonals of the square, AC and BD, intersect at M.
V is vertically above M and $VM = 10$ cm.

Calculate the angle between VA and the base.

..... [4]

68. 0580_s19_QP_22 Q: 24



NOT TO SCALE

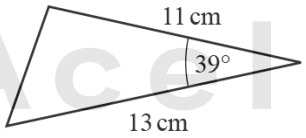
ABCDEFGH is a cuboid.
$AB = 18$ cm, $BC = 7$ cm and $CG = 12$ cm.

Calculate the angle that the diagonal AG makes with the base $ABCD$.

..... [4]

---

69. 0580_w19_QP_21 Q: 13



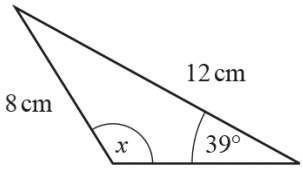
NOT TO SCALE

Calculate the area of the triangle.

..... cm^2 [2]

---

70. 0580_w19_QP_21 Q: 16



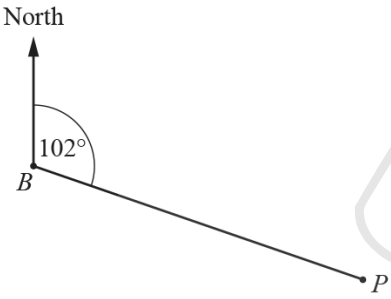
NOT TO SCALE

Calculate the **obtuse** angle x in this triangle.

$x =$ ..... [3]

---

71. 0580_w19_QP_22 Q: 8



NOT TO SCALE

The bearing of P from B is 102°.

Find the bearing of B from P.

..... [2]

---

72. 0580_w19_QP_23 Q: 8

When $\sin x° = 0.36$, find

(a) the acute angle $x°$,

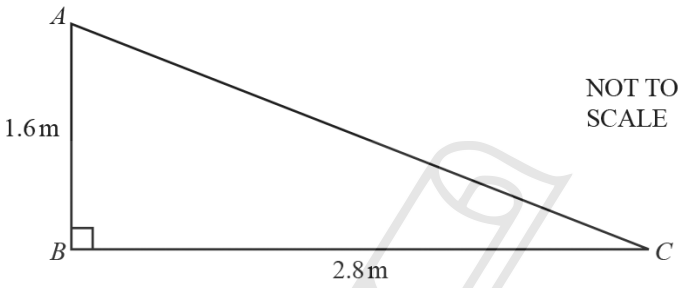
..... [1]

(b) the obtuse angle $x°$.

..... [1]

---

73. 0580_m18_QP_22 Q: 16



(a) Find the area of triangle ABC.

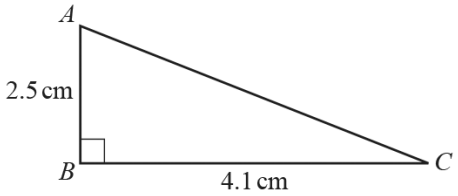
..... m^2 [2]

(b) Calculate AC.

$AC =$ ..... m [2]

---

74. 0580_s18_QP_21 Q: 7



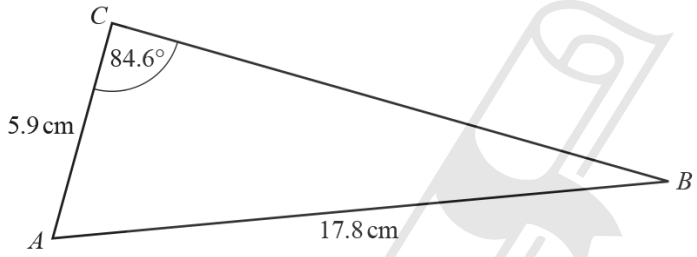
NOT TO SCALE

Calculate the length of AC.

$AC =$ ..... cm [2]

---

75. 0580_s18_QP_21 Q: 14



NOT TO SCALE

Use the sine rule to find angle ABC.

Angle $ABC =$ ..... [3]

---

76. 0580_s18_QP_22 Q: 7

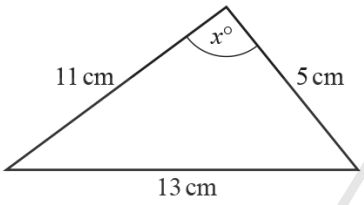
A and B are two towns on a map.
The bearing of A from B is 140°.

Work out the bearing of B from A.

..... [2]

---

77. 0580_s18_QP_23 Q: 23



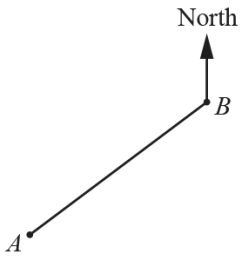
NOT TO SCALE

Calculate the value of x.

x = ... [4]

---

78. 0580_w18_QP_21 Q: 6



NOT TO SCALE

The bearing of A from B is 227°.

Find the bearing of B from A.

..... [2]

---

79. 0580_w18_QP_22 Q: 12

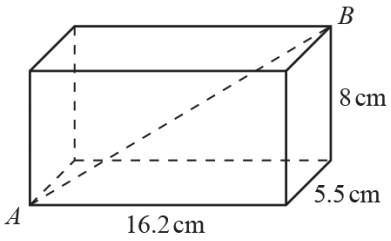
$x°$ is an **obtuse** angle and $\sin x° = 0.43$.

Find the value of x.

$x =$ ..... [2]

---

80. 0580_w18_QP_22 Q: 22



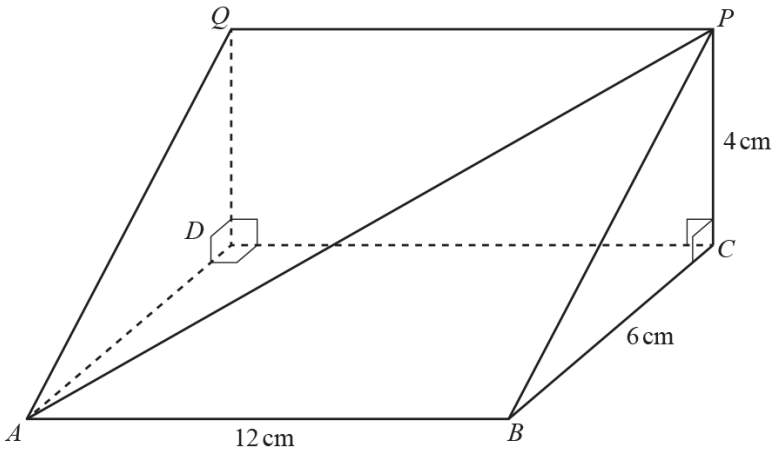
NOT TO SCALE

The diagram shows a cuboid with dimensions 5.5 cm, 8 cm and 16.2 cm.

Calculate the angle between the line AB and the horizontal base of the cuboid.

..... [4]

81. 0580_w18_QP_23 Q: 23



NOT TO SCALE

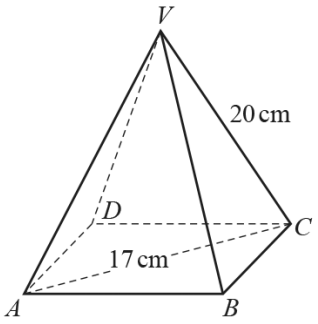
The diagram shows a triangular prism.
$AB = 12$ cm, $BC = 6$ cm, $PC = 4$ cm, angle $BCP = 90°$ and angle $QDC = 90°$.

Calculate the angle between AP and the rectangular base $ABCD$.

..... [4]

82. 0580_m17_QP_22 Q: 9

The diagram shows a pyramid with a square base $ABCD$.
All the sloping edges of the pyramid are 20 cm long and $AC = 17$ cm.

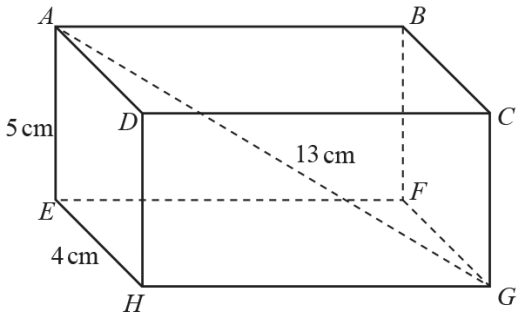


NOT TO SCALE

Calculate the height of the pyramid.

..... cm [3]

83. 0580_s17_QP_21 Q: 13



NOT TO SCALE

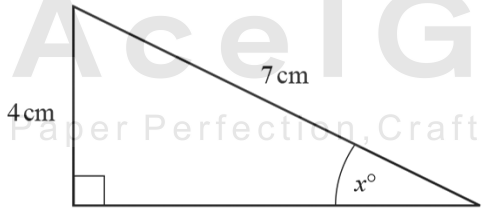
The diagram shows a cuboid $ABCDEFGH$.
$AE = 5$ cm, $EH = 4$ cm and $AG = 13$ cm.

Calculate the angle between the line AG and the base $EFGH$ of the cuboid.

..... [3]

---

84. 0580_s17_QP_22 Q: 12



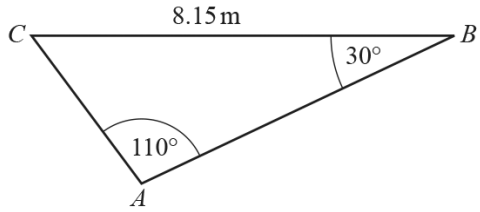
NOT TO SCALE

Calculate the value of x.

$x =$ ..... [2]

---

85. 0580_s17_QP_22 Q: 17



NOT TO SCALE

Calculate AC.

$AC =$ ..... m [3]

---

86. 0580_s17_QP_22 Q: 19

In a triangle PQR, $PQ = 8$ cm and $QR = 7$ cm.
The area of this triangle is 17 cm^2.

Calculate the two possible values of angle PQR.

Angle $PQR =$ ..... or ..... [3]

---

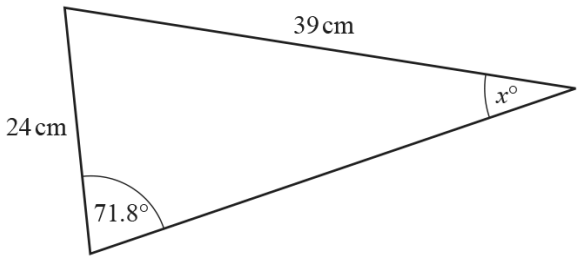
87. 0580_s17_QP_23 Q: 1

Calculate $\sqrt{\frac{1}{2}(1-\cos 48°)}$.

..... [1]

---

88. 0580_s17_QP_23 Q: 15



NOT TO SCALE

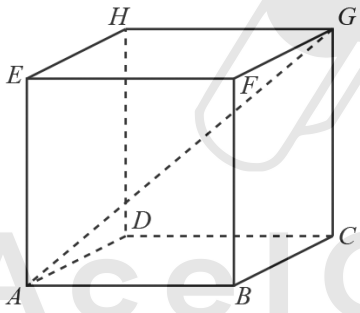
Find the value of x.

$x =$ ..... [3]

---

89. 0580_s17_QP_23 Q: 22

The diagram shows a cube $ABCDEFGH$ of side length 26 cm.



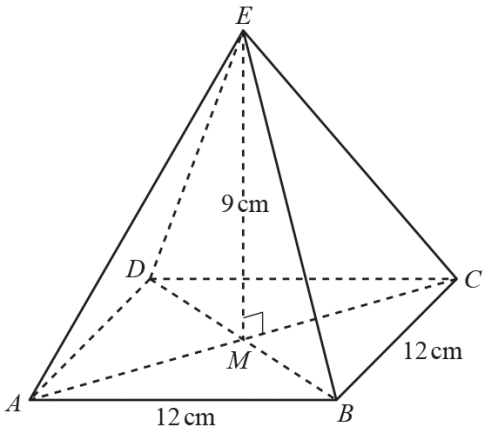
NOT TO SCALE

Calculate the angle between AG and the base of the cube.

..... [4]

---

90. 0580_w17_QP_21 Q: 21



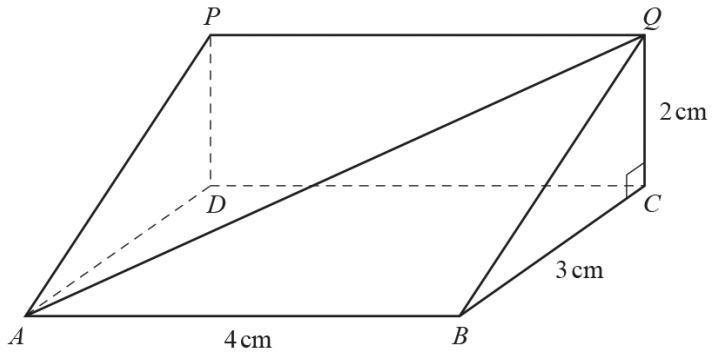
NOT TO SCALE

The diagram shows a square-based pyramid $ABCDE$.
The diagonals of the square meet at M.
E is vertically above M.
$AB = BC = 12$ cm and $EM = 9$ cm.

Calculate the angle between the edge EC and the base, $ABCD$, of the pyramid.

..... [4]

91. 0580_w17_QP_22 Q: 26



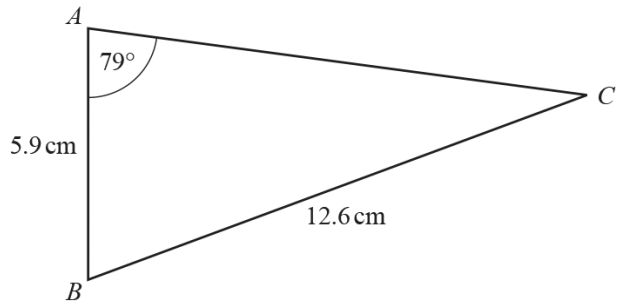
NOT TO SCALE

The diagram shows a prism of length 4 cm.
The cross section is a right-angled triangle.
$BC = 3$ cm and $CQ = 2$ cm.

Calculate the angle between the line AQ and the base, $ABCD$, of the prism.

..... [4]

92. 0580_w17_QP_23 Q: 18



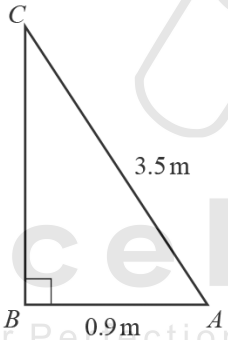
NOT TO SCALE

Calculate angle *ABC*.

Angle *ABC* = ... [4]

---

93. 0580_m16_QP_22 Q: 3



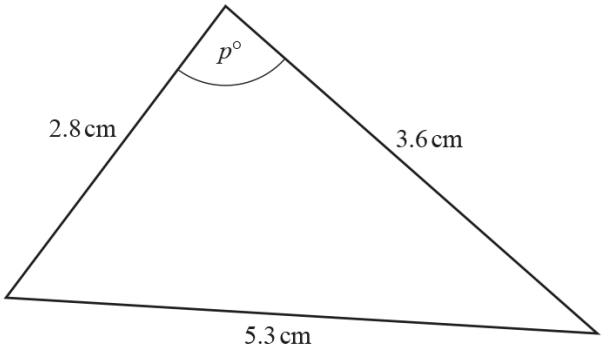
NOT TO SCALE

Calculate angle *BAC*.

Angle *BAC* = ... [2]

---

94. 0580_m16_QP_22 Q: 15

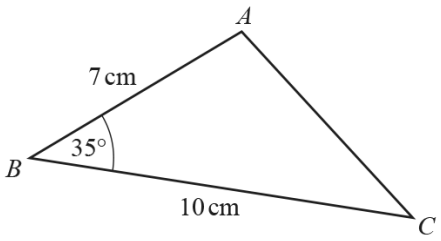


NOT TO SCALE

Find the value of p.

p = ... [4]

95. 0580_s16_QP_21 Q: 26



NOT TO SCALE

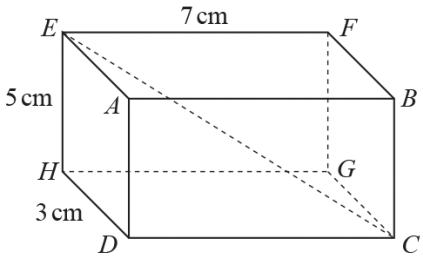
(a) Calculate the area of triangle ABC.

..... cm^2 [2]

(b) Calculate the length of AC.

AC = ... cm [4]

96. 0580_s16_QP_23 Q: 23



NOT TO SCALE

The diagram shows a cuboid.
$HD = 3$ cm, $EH = 5$ cm and $EF = 7$ cm.

Calculate

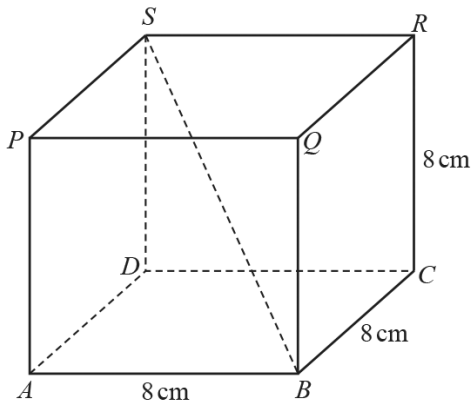
(a) the length CE,

$CE =$ ..... cm [4]

(b) the angle between CE and the base $CDHG$.

..... [3]

97. 0580_w16_QP_21 Q: 24



NOT TO SCALE

The diagram shows a cube of side length 8 cm.

(a) Calculate the length of the diagonal *BS*.

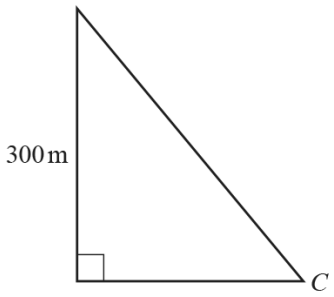
BS = ... cm [3]

(b) Calculate angle *SBD*.

Angle *SBD* = ... [2]

98. 0580_w16_QP_22 Q: 9

From the top of a building, 300 metres high, the angle of depression of a car, C, is 52°.



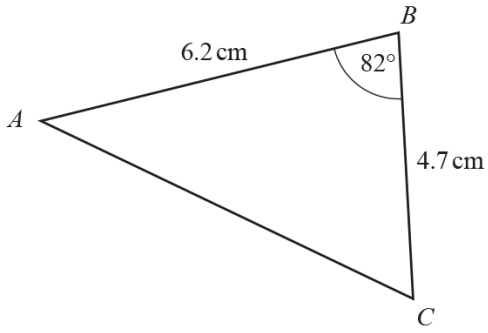
NOT TO SCALE

Calculate the horizontal distance from the car to the base of the building.

..... m [3]

99. 0580_w16_QP_23 Q: 21

(a)

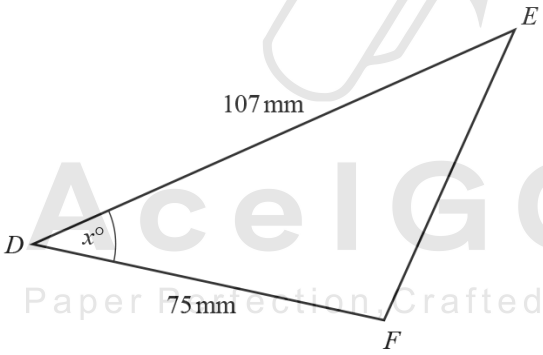


NOT TO SCALE

Calculate the area of triangle *ABC*.

..... cm^2 [2]

(b)



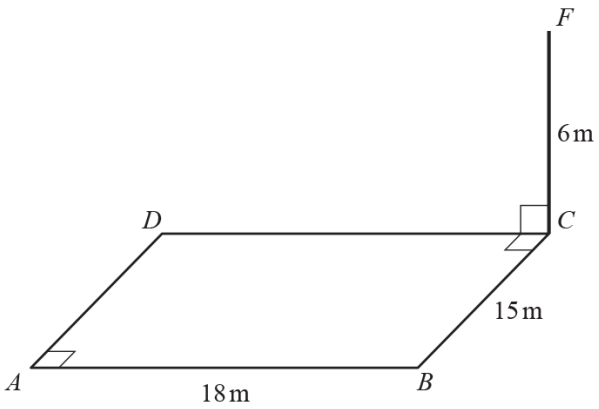
NOT TO SCALE

The area of triangle *DEF* is 2050 mm^2.

Work out the value of *x*.

x = ... [2]

100. 0580_m15_QP_22 Q: 18



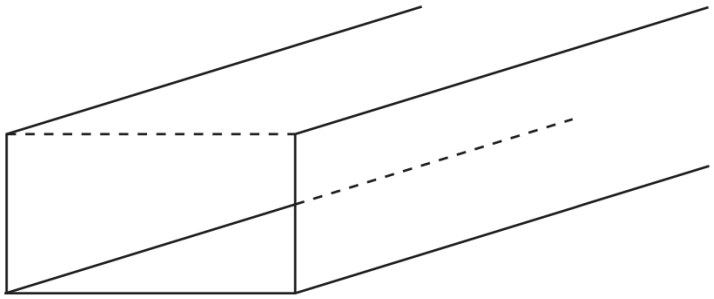
NOT TO SCALE

The diagram shows a rectangular playground $ABCD$ on horizontal ground.
A vertical flagpole CF, 6 metres high, stands in corner C.
$AB = 18$ m and $BC = 15$ m.

Calculate the angle of elevation of F from A.

Answer ..... [4]

101. 0580_s15_QP_22 Q: 14



The diagram shows a channel for water.
The channel lies on horizontal ground.
This channel has a constant rectangular cross section with area 0.95 m^2.
The channel is full and the water flows through the channel at a rate of 4 metres/**minute**.

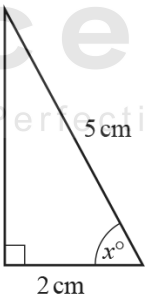
Calculate the number of cubic metres of water that flow along the channel in 3 **hours**.

Answer ..... m^3 [3]

---

102. 0580_s15_QP_23 Q: 3

NOT TO SCALE

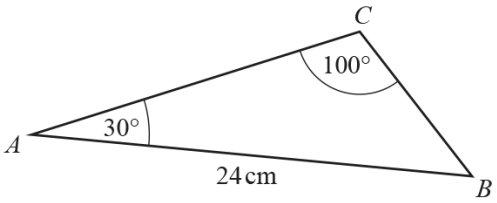


Calculate the value of x.

Answer x = ... [2]

---

103. 0580_s15_QP_23 Q: 11



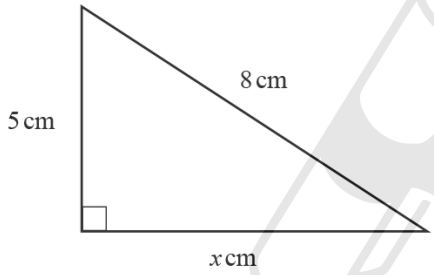
NOT TO SCALE

Use the sine rule to calculate *BC*.

Answer BC = ... cm [3]

---

104. 0580_w15_QP_22 Q: 11



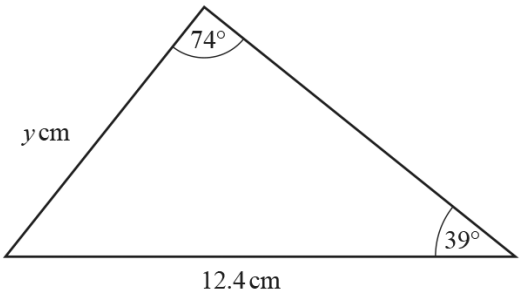
NOT TO SCALE

Calculate the value of *x*.

Answer x = ... [3]

---

105. 0580_w15_QP_22 Q: 13



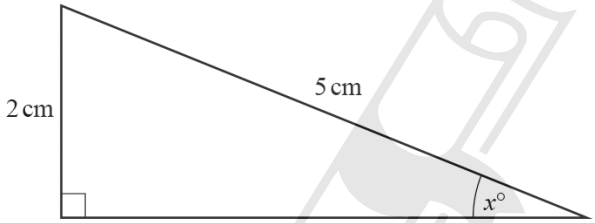
NOT TO SCALE

Calculate the value of y.

Answer y = ... [3]

---

106. 0580_w15_QP_23 Q: 9



NOT TO SCALE

Calculate the value of x.

Answer x = ... [2]

---

107. 0580_s14_QP_21 Q: 11

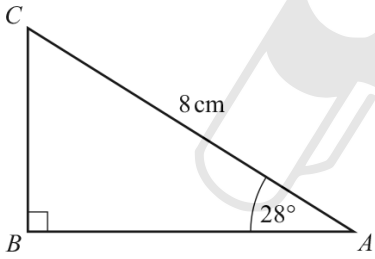
A triangle has sides of length 2 cm, 8 cm and 9 cm.

Calculate the value of the largest angle in this triangle.

Answer ..... [4]

---

108. 0580_s14_QP_22 Q: 4



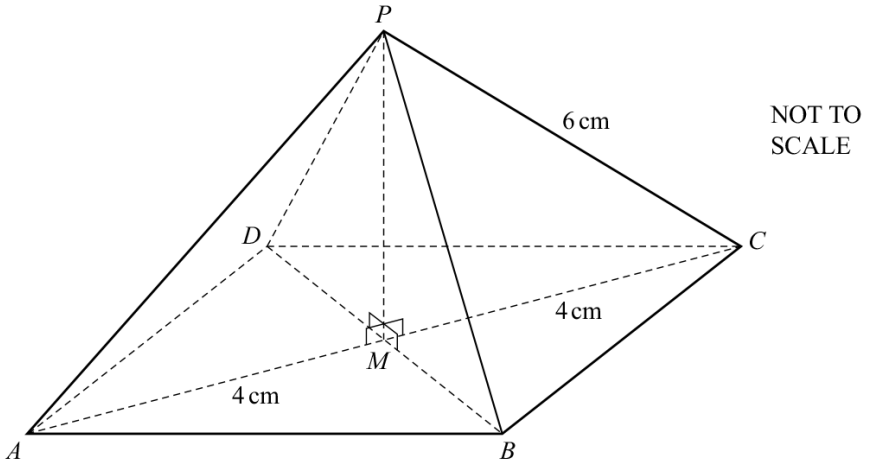
NOT TO SCALE

Calculate the length of *AB*.

Answer AB = ... cm [2]

---

109. 0580_s14_QP_22 Q: 21



The diagram shows a pyramid on a square base *ABCD* with diagonals, *AC* and *BD*, of length 8 cm.
AC and *BD* meet at *M* and the vertex, *P*, of the pyramid is vertically above *M*.
The sloping edges of the pyramid are of length 6 cm.

Calculate

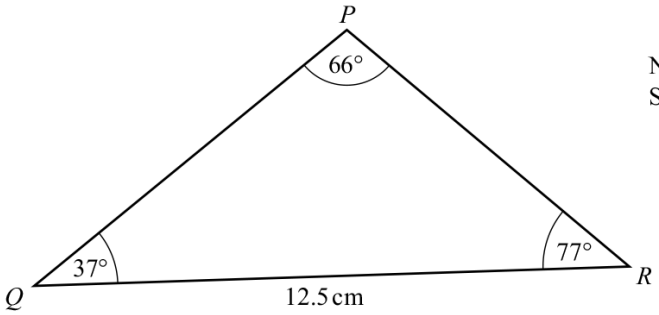
(a) the perpendicular height, *PM*, of the pyramid,

Answer(a) PM = ... cm [3]

(b) the angle between a sloping edge and the base of the pyramid.

Answer(b) ..... [3]

110. 0580_s14_QP_23 Q: 14

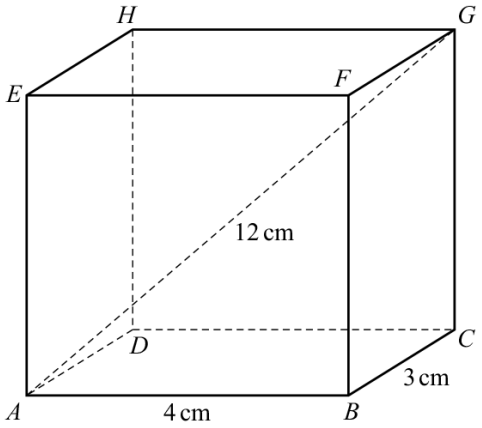


NOT TO SCALE

Calculate *PR*.

Answer PR = ... cm [3]

111. 0580_s14_QP_23 Q: 16



NOT TO SCALE

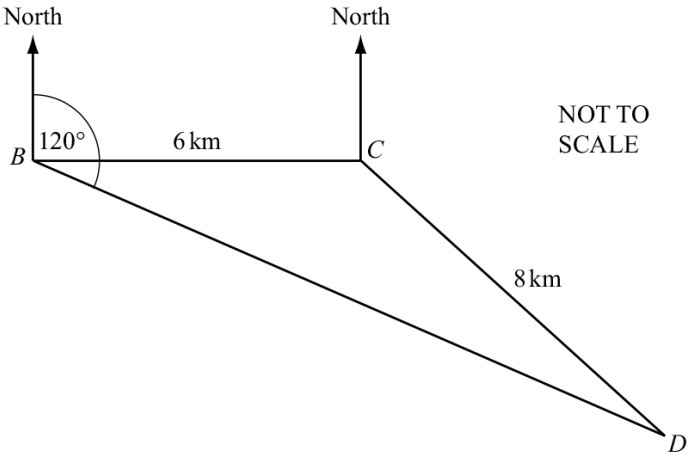
ABCDEFGH is a cuboid.
AB = 4 cm, *BC* = 3 cm and *AG* = 12 cm.

Calculate the angle that *AG* makes with the base *ABCD*.

Answer ..... [4]

112. 0580_w14_QP_21 Q: 16

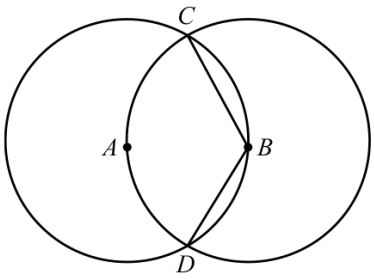
A helicopter flies from its base B to deliver supplies to two oil rigs at C and D.
C is 6 km due east of B and the distance from C to D is 8 km.
D is on a bearing of 120° from B.



Find the bearing of D from C.

Answer ..... [5]

113. 0580_w14_QP_21 Q: 19



NOT TO SCALE

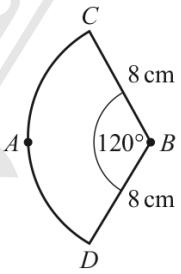
Two circles, centres A and B, are each of radius 8 cm and intersect at C and D.
Each circle passes through the centre of the other circle.

(a) Explain why angle CBD is 120°.

Answer(a)

[1]

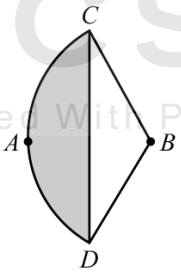
(b) For the circle, centre B, find the area of the sector BCD.



NOT TO SCALE

Answer(b) ..... cm^2 [2]

(c) **(i)** Find the area of the shaded segment CAD.



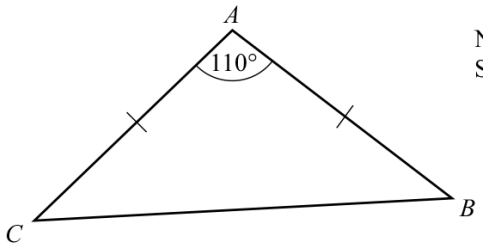
NOT TO SCALE

Answer(c)(i) ..... cm^2 [3]

(ii) Find the area of overlap of the two circles.

Answer(c)(ii) ..... cm^2 [1]

114. 0580_w14_QP_22 Q: 13



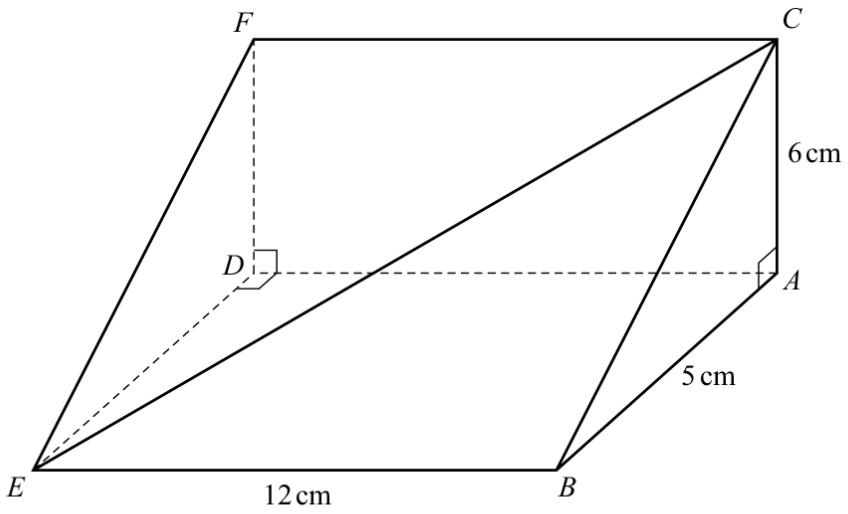
NOT TO SCALE

Triangle ABC is isosceles with $AB = AC$.
Angle $BAC = 110°$ and the area of the triangle is $85\,cm^2$.

Calculate AC.

Answer $AC =$ ..... cm [3]

115. 0580_s13_QP_21 Q: 23



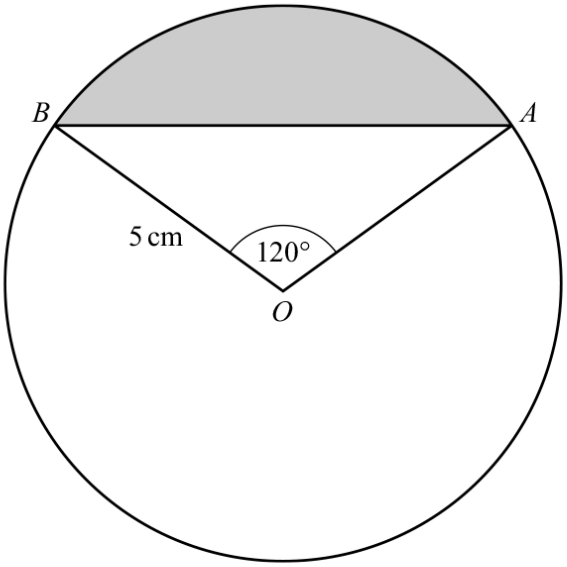
NOT TO SCALE

The diagram shows a triangular prism of length 12 cm.
Triangle ABC is a cross section of the prism.
Angle $BAC = 90°$, $AC = 6$ cm and $AB = 5$ cm.

Calculate the angle between the line CE and the base $ABED$.

Answer ..... [4]

116. 0580_s13_QP_23 Q: 18



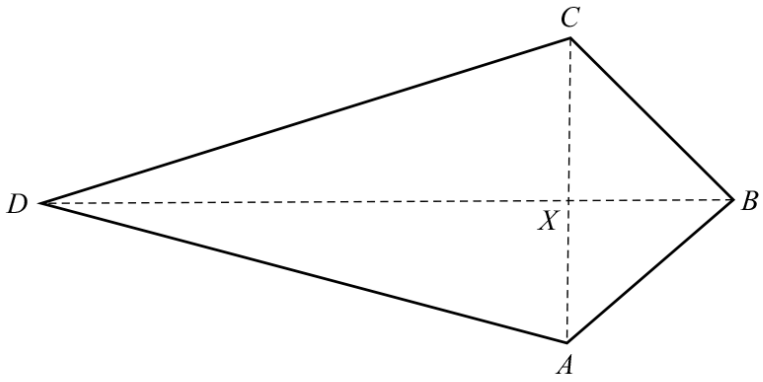
NOT TO SCALE

A and B lie on a circle centre O, radius 5 cm.
Angle $AOB = 120°$.

Find the area of the shaded segment.

Answer ..... cm^2 [4]

117. 0580_w13_QP_21 Q: 21



NOT TO SCALE

ABCD is a kite.
The diagonals *AC* and *BD* intersect at *X*.
AC = 12 cm, *BD* = 20 cm and *DX* : *XB* = 3 : 2 .

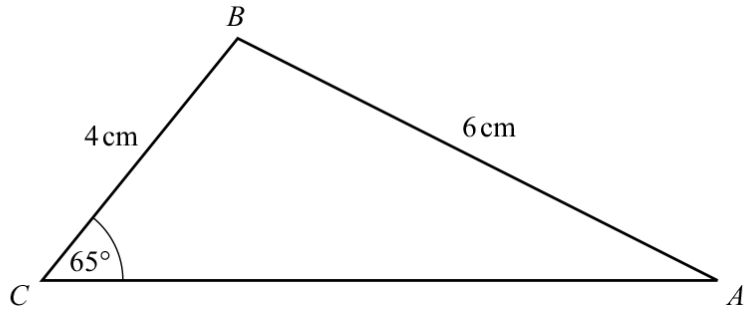
(a) Calculate angle *ABC*.

Answer(a) Angle *ABC* = ... [3]

(b) Calculate the area of the kite.

Answer(b) ..... cm^2 [2]

118. 0580_w13_QP_22 Q: 21



NOT TO SCALE

In triangle ABC, $AB = 6$ cm, $BC = 4$ cm and angle $BCA = 65°$.

Calculate

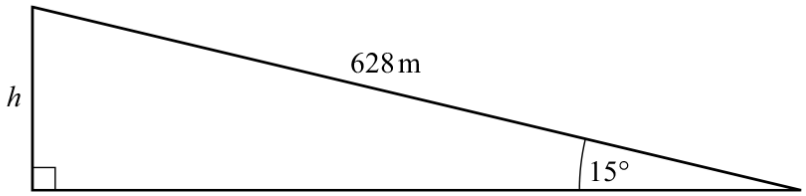
(a) angle CAB,

Answer(a) Angle CAB = ... [3]

(b) the area of triangle ABC.

Answer(b) ..... cm^2 [3]

119. 0580_w13_QP_23 Q: 10



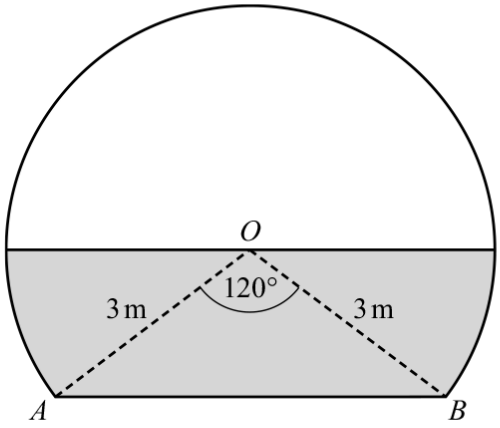
NOT TO SCALE

Calculate the length h.
Give your answer correct to 2 significant figures.

Answer $h =$ ..... m [3]

120. 0580_w13_QP_23 Q: 16

The diagram shows the entrance to a tunnel.
The circular arc has a radius of 3 m and centre O.
AB is horizontal and angle $AOB = 120°$.



NOT TO SCALE

During a storm the tunnel filled with water, to the level shown by the shaded area in the diagram.

(a) Calculate the shaded area.

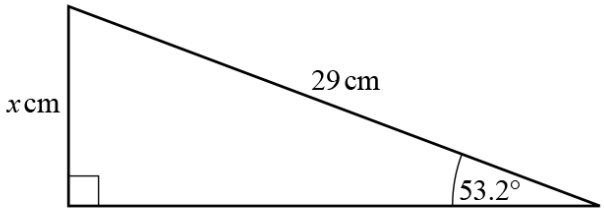
Answer(a) ..... m^2 [4]

(b) The tunnel is 50 m long.

Calculate the volume of water in the tunnel.

Answer(b) ..... m^3 [1]

121. 0580_s12_QP_21 Q: 5

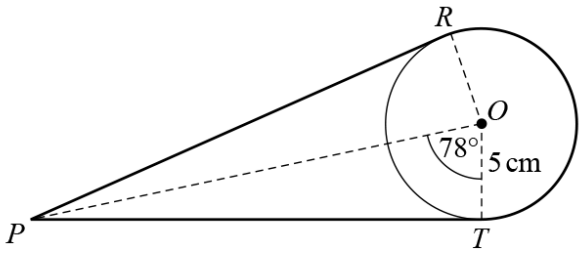


NOT TO SCALE

Calculate the value of x.

Answer x = ... [2]

122. 0580_s12_QP_21 Q: 20



NOT TO SCALE

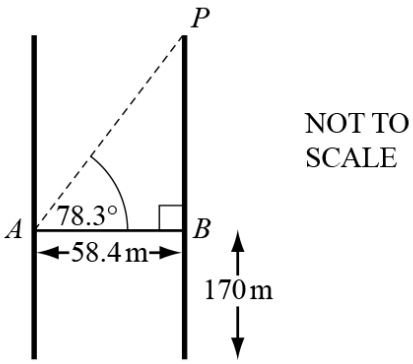
R and T are points on a circle, centre O, with radius 5 cm.
PR and PT are tangents to the circle and angle $POT = 78°$.

A thin rope goes from P to R, around the major arc RT and then from T to P.

Calculate the length of the rope.

Answer ..... cm [6]

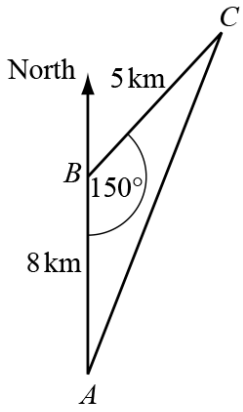
123. 0580_s12_QP_22 Q: 9



The line AB represents the glass walkway between the Petronas Towers in Kuala Lumpur.
The walkway is 58.4 metres long and is 170 metres above the ground.
The angle of elevation of the point P from A is 78.3°.

Calculate the height of P above the ground.

Answer ..... m [3]



NOT TO SCALE

A helicopter flies 8 km due north from A to B. It then flies 5 km from B to C and returns to A.
Angle $ABC = 150°$.

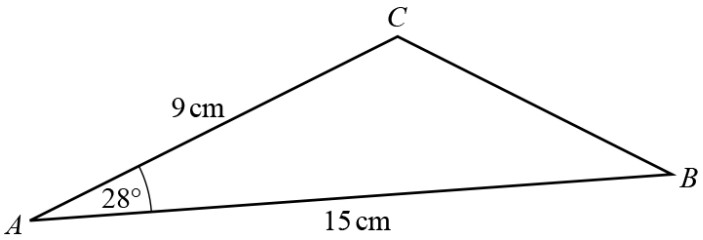
(a) Calculate the area of triangle ABC.

Answer(a) ..... km^2 [2]

(b) Find the bearing of B from C.

Answer(b) ..... [2]

125. 0580_s12_QP_23 Q: 6

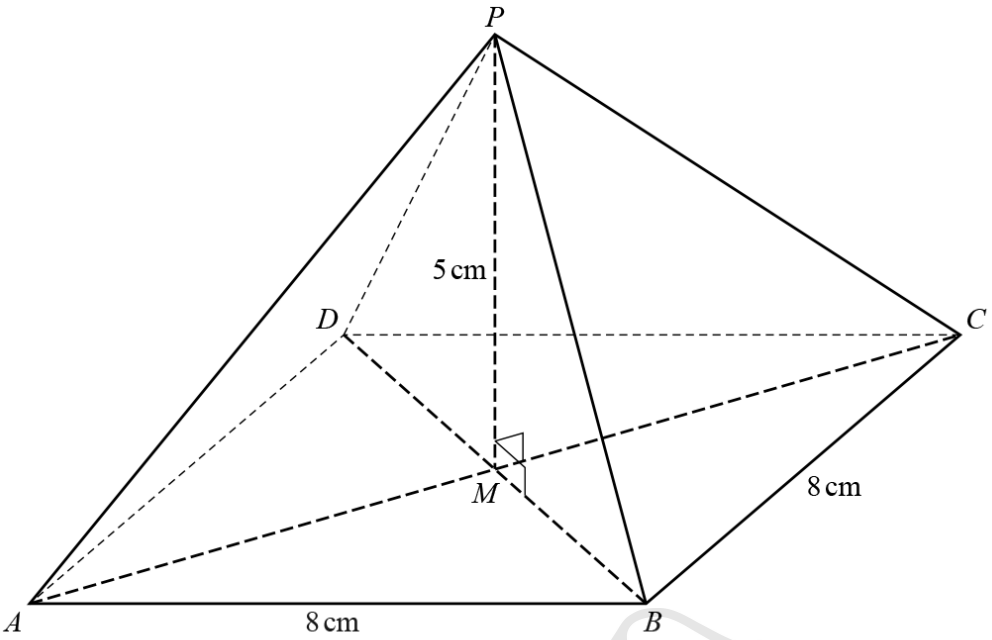


NOT TO SCALE

Calculate the area of triangle ABC.

Answer ..... cm^2 [2]

126. 0580_s12_QP_23 Q: 21



NOT TO SCALE

The diagram shows a pyramid on a square base *ABCD*.
The diagonals of the base, *AC* and *BD*, intersect at *M*.
The sides of the square are 8 cm and the vertical height of the pyramid, *PM*, is 5 cm.

Calculate

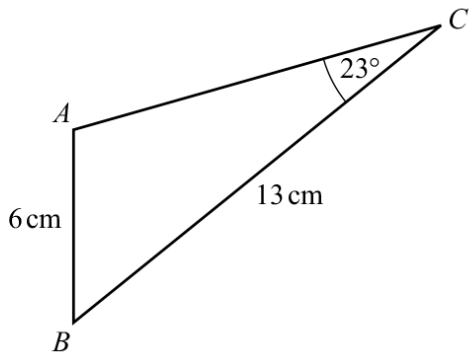
(a) the length of the edge *PB*,

Answer(a) PB = ... cm [3]

(b) the angle between *PB* and the base *ABCD*.

Answer(b) ..... [3]

127. 0580_w12_QP_23 Q: 18

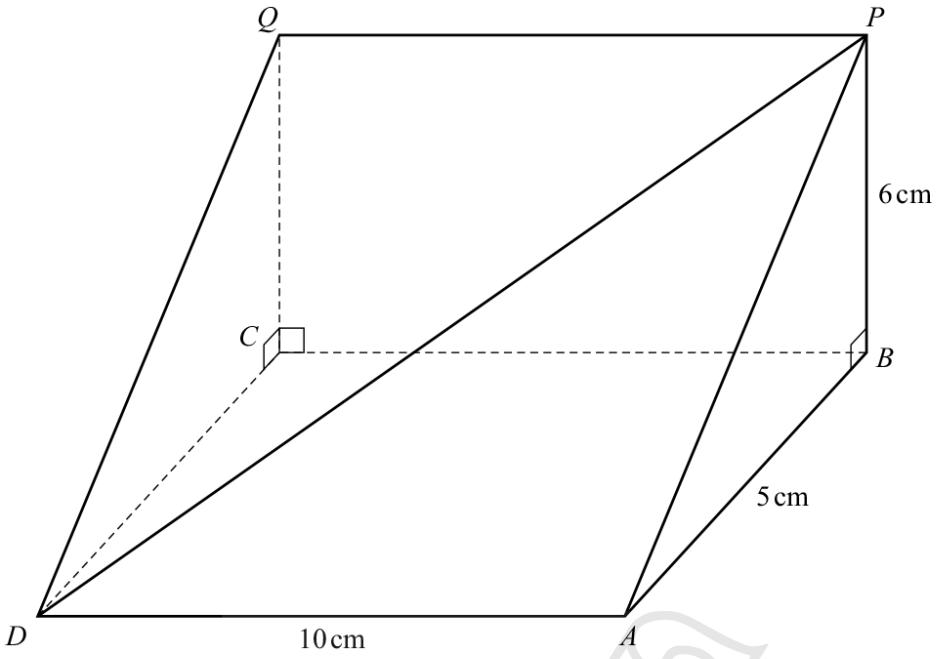


NOT TO SCALE

In triangle ABC, $AB = 6$ cm, $BC = 13$ cm and angle $ACB = 23°$.
Calculate angle BAC, which is obtuse.

Answer Angle BAC = ... [4]

128. 0580_w12_QP_23 Q: 24



NOT TO SCALE

The diagram shows a triangular prism.
$ABCD$ is a horizontal rectangle with $DA = 10$ cm and $AB = 5$ cm.
$BCQP$ is a vertical rectangle and $BP = 6$ cm.

Calculate

(a) the length of DP,

Answer(a) $DP =$ ..... cm [3]

(b) the angle between DP and the horizontal rectangle $ABCD$.

Answer(b) ..... [3]