

Past-paper walk-through

Trigonometric functions ■ E6.4

eXercise

Questions in this set

- 0580/22 N25 Q19 ■ 3 marks
- 0580/41 N25 Q29 ■ 4 marks
- 0580/42 N25 Q15 ■ 10 marks
- 0580/43 N25 Q18 ■ 6 marks
- 0580/43 N25 Q24 ■ 6 marks
- 0580/41 J25 Q17 ■ 10 marks

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

Question 19

0580/22 N25 ■ Q19 ■ 3 marks

19 NOT TO SCALE 7 cm 5 cm 5 cm

The diagram shows a box in the shape of a cuboid.

Mala has a straight rod of length 10 cm.

Show that this rod does not fit completely inside the box.

[3]

[3]

Solution 19

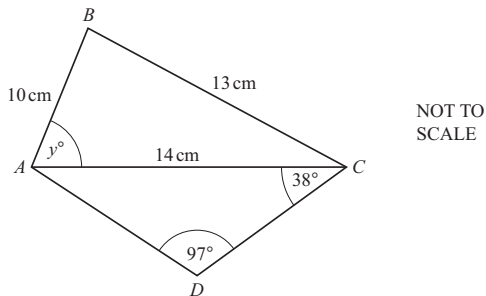
Mark scheme

- 99 and states this is less than 10 oe
- 3 B2 for
- 99
- or M2 for $52 + 52 + 72$ oe
- or M1 for $52 + 52$ or $52 + 72$ oe

Question 29

0580/41 N25 ■ Q29 ■ 4 marks

29

(a) Calculate the value of y .

Question 29

(a) Calculate the value of y .

Question 29

(b) Calculate BD .

Question 29

$$RD = \quad \text{cm [5]}$$

Solution 29

(a) Mark scheme

- 63.0 or 63.02 to 63.03
- 3 M2
- for $[\cos y =]$
- 2
- 2
- 2
- 10
- 14

Solution 29

- 13
- 2 10 14
- +
- −
- ×
- ×
- oe
- or M1 for $13^2 = 10^2 + 14^2 - 2 \times 10 \times 14 \times \cos y$ oe

Solution 29

(b) Mark scheme

- 15.1 or 15.13 to 15.14
- 5 M2 for $[AD] = 14\sin 38$
- $\sin 97$
- or M1 for
- 14
- $\sin 38$
- $\sin 97$
- =

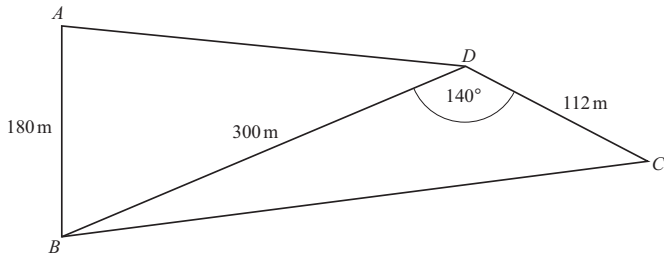
Solution 29

- AD
- oe M2
- for $10^2 + (\text{their AD})^2 - 2 \times 10 \times \text{their AD} \times$
- $\cos(\text{their } y + 180 - 97 - 38)$
- or M1 for angle $\text{BAD} = \text{their } y + 180 - 97 - 38$ so i

Question 15

0580/42 N25 ■ Q15 ■ 10 marks

15

NOT TO
SCALE

The diagram shows a field, $ABCD$, in the shape of a quadrilateral.
 BD is a straight path across the field.

(a) Calculate BC .

Question 15

(a) Calculate DC .

Question 15

(b) Calculate angle DBC .

Question 15

- (c) The total area of the field, $ABCD$, is $35\,900\text{ m}^2$.

Work out the length of the shortest distance from D to AB .

Question 15

Question 15

Solution 15

(a) Mark scheme

- 392 or 392.4 to 392.5
- 3 M2 for
- 2
- 2
- 300
- 112
- $2 \times 300 \times 112 \cos 140$
- +

Solution 15

- $-\times$
- $\times$
- $\times$
- OR M1
- for
- 2
- 2
- 300
- 112
- $2 \cdot 300 \cdot 112 \cos 140^\circ$

Solution 15

■ +

■ −

■ ×

■ ×

■ × **A1**

■ for 154 022[...]

Solution 15

(b) Mark scheme

- 10.6 or 10.7 or 10.55 to
- 10.69
- 3 M2 for $112\sin 140$
- their (a) oe
- or
- 2
- 2
- 2

Solution 15

- 300
- (
-)
- 112
- cos[
-]
- 2
- 300
- their
- DBC

Solution 15

- their
- +
- −
- =
- $\times$
- $\times$
- (a)
- (a)
- or M1 for
- 112

Solution 15

- sin
- sin140
- their
- DBC =
- (a) oe
- or
- 2
- 2
- 2
- 112

Solution 15

- 300
- (
-)
- 2
- 300
- cos
- their
- their
- DBC
- =

Solution 15

■ +

■ −

■ ×

■ ×

■ ×

■ (a)

■ (a)

■ oe

Solution 15

(c) Mark scheme

- 279 or 278.9...
- 4 M3 for
- $(35\,900 - 1\,112\,300 \sin 140$
- $2 \times$
- $\times$
- $\times$
- $) \div 1$
- 180

Solution 15

- 2
- (
-)
- $\times$
- (
-)
- (
-)
- oe
- OR M1

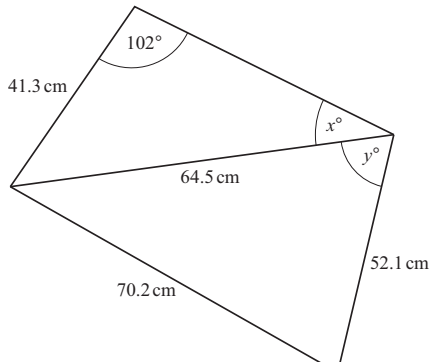
Solution 15

- for $112300 \sin 140^\circ$
- $2 \times$
- $\times$
- $\times$
- oe M1
- for recognition that the shortest distance from D
- is perpendicular to AB

Question 18

0580/43 N25 ■ Q18 ■ 6 marks

18

NOT TO
SCALE

Question 18



- (a) Calculate the value of x .

Question 18

(b) Calculate the value of y .

Solution 18

(a) Mark scheme

- 38.8 or 38.77 to 38.78
- 3 M2 for $[\sin x =] 41.3\sin 102$
- 64.5
- oe or better
- or M1 for 64.5
- 41.3
- $\sin 102$
- $\sin$

Solution 18

■ =

■ x

■ oe

Solution 18

(b) Mark scheme

- 73.2 or 73.16...
- 3 M2
- for
- 2
- 2
- 2
- 64.5
- 52.1

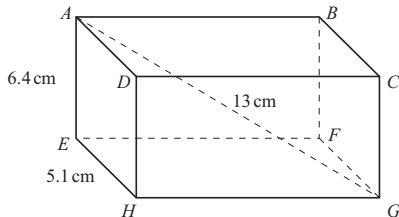
Solution 18

- 70.2
- $2 \times 64.5 \times 52.1$
- $+$
- $-$
- $\times$
- $\times$
- or M1 for $70.22 = 64.52 + 52.12 - 2 \times 64.5$
- $\times 52.1 \times \cos y$

Question 24

0580/43 N25 ■ Q24 ■ 6 marks

24

NOT TO
SCALE

The diagram shows a cuboid $ABCDEFGH$.
 $AE = 6.4$ cm, $EH = 5.1$ cm and $AG = 13$ cm.

(a) Calculate EF .

Question 24

Question 24

- (b) Calculate the angle between the line AG and the base $EFGH$ of the cuboid.

Question 24

Solution 24

(a)

Mark scheme

- 10.1 or 10.10...
- 3 M2 for $EF2 + 6.42 + 5.12 = 132$ or better
- or M1 for $6.42 + 5.12$ or $132 - 6.42$ or 132
- $- 5.12$

Solution 24

(b)

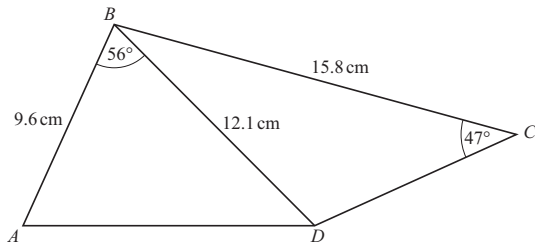
Mark scheme

- 29.5 or 29.49... to 29.54...
- 3 M2 for $\sin [\dots =] 6.4$
- 13
- oe
- or M1 for identifying angle AGE

Question 17

0580/41 J25 ■ Q17 ■ 10 marks

17

NOT TO
SCALE

The diagram shows a quadrilateral $ABCD$.

- (a) Calculate AD .

Question 17

Question 17

(b) Calculate the obtuse angle BDC .

Question 17

- (c) Calculate the area of the quadrilateral.

Question 17

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Solution 17

(a) Mark scheme

- 10.4 or 10.42...
- 3 M2 for
- 2
- 2
- 9.6
- 12.1
- $2 \times 9.6 \times 12.1 \cos 56$
- +

Solution 17

- — ×

- ×

- ×

- OR (M1)

- for $9.62 + 12.12 - 2 \times 9.6 \times 12.1 \times \cos 56$ (A1)

- for 108.6 to 108.7

- 0580/41

- May/June 2025

- Partial Marks

Solution 17

(b) Mark scheme

- 107.2 to 107.3
- 4 B3 for 72.7[4...]
- OR M3
- for
- 1
- s
- 180
- sin

Solution 17

- 15.8

- 12.

- i

- 1

- n^{47}

- $-($

- $)$

- $-$

- $\times$

- $($

Solution 17

-)
- (
-) M2
- for [sinBDC =]
- sin47
- 15.8
- 12.1
- ×
- or M1 for
- sin

Solution 17

- $\sin 47^\circ$
- 15.8
- 12.1
- =
- BDC

Solution 17

(c) Mark scheme

- 89.59 to 89.80...
- 3 M1 for $\frac{1}{2} \times 9.6 \times 12.1 \times \sin 56$ (M1)
- for $\frac{1}{2} \times 15.8 \times 12.1 \times \sin(133 - \text{their$
- BDC)
- 18
- $a = 2$
- $b = 3$
- $c = 20$

Solution 17

- 3 B2 for any two correct
- For c, FT 2 + their $a \times$ their $(b)^2$
- or B1 for
- 3
- =
- b
- nfw
- OR B2
- for (
-)

Solution 17

- 2
- 2
- 3
- 20
- +
- −
- x
- or M1 for $(x + 3)^2$ seen
- or for
- 2

Solution 17

- 2
- 2
- +
- +
- −
- ax
- abx
- ab
- c
- or for

Solution 17

- 2
- =
- a
- and one of 2/12 $ab =$
- and
- 2
- 2
- —
- = —
- ab

Solution 17

■ C