2021 Assessment resources
GCSE Mathematics

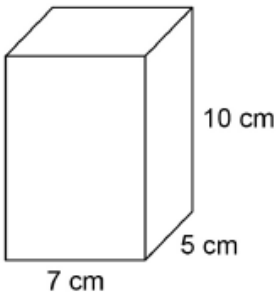
Geometry – Foundation

Answers and commentaries

The question numbers in this resource reflect the question numbers from the original papers and match the question numbers in the corresponding 2021 assessment materials

Question 14

14 Here is a cuboid.



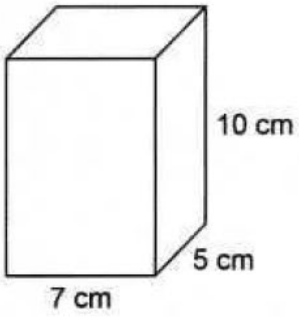
Work out the volume.

[2 marks]

Answer _____ cm^3

Student A

14 Here is a cuboid.



Work out the volume.

[2 marks]

$7 \times 5 = 35$

$35 \times 10 = \frac{350}{2} = 175.$ M 1

$7 + 5 + 10 = \frac{22}{2} = 11$

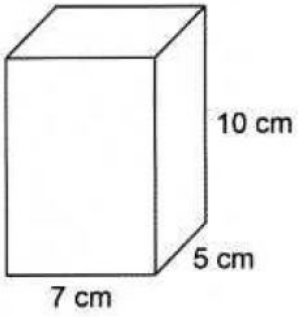
Answer 175. A 0 cm^3

Commentary

Although there are two methods shown, it is the one ending in 175 that leads to the answer so that is the one that is marked. The Additional Guidance condones dividing by 2 for the first mark.
1 mark

Student B

14 Here is a cuboid.



Work out the volume.

[2 marks]

7x5x10=350

6x6x6x6x6=2359

M 0

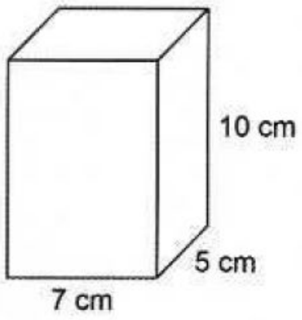
Answer 2359 cm^3

Commentary

The correct method is seen but the method that leads to the answer is incorrect.
0 marks

Student C

14 Here is a cuboid.



Work out the volume.

[2 marks]

~~Volume = density × area~~

Area = 350 cm²

perimeter = 22 cm

350^2 ×
350
12000
175000
105000
28000

M 0

Answer 28000 0 cm³

Commentary

Although the student states that the area is 350 cm^2, their answer comes from 350^2 (a common misconception) and the Additional Guidance awards this M0A0

0 marks

Question 1

Please see the mark scheme

Question 13

No examples available.

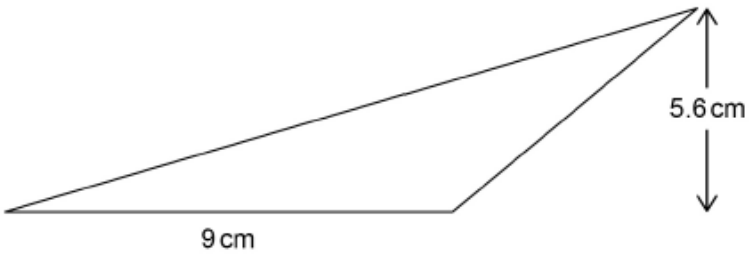
Commentary

The first mark is for a complete method that would lead to an answer of 53 if evaluated correctly. If the student only gives the answer of 53 with no method, then that is full marks. Ignoring the right angle will not score any marks and assuming that two of the lines form a straight line will also gain no marks.

Question 14

14 A triangle has base 9 cm and perpendicular height 5.6 cm

Not drawn accurately



Work out the area of the triangle.

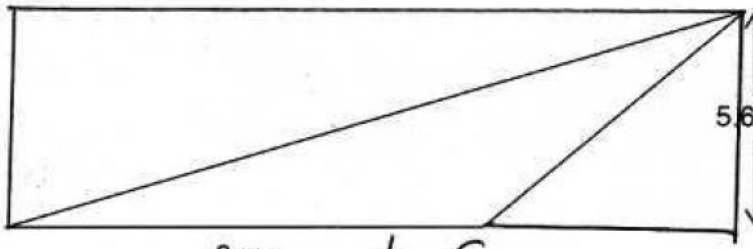
[2 marks]

Answer _____ cm^2

Student A

14 A triangle has base 9 cm and perpendicular height 5.6 cm

Not drawn accurately



M 0

Work out the area of the triangle.

[2 marks]

½ b x h = 4.5 x 2.8 = 12.6

Answer 12.6 cm²

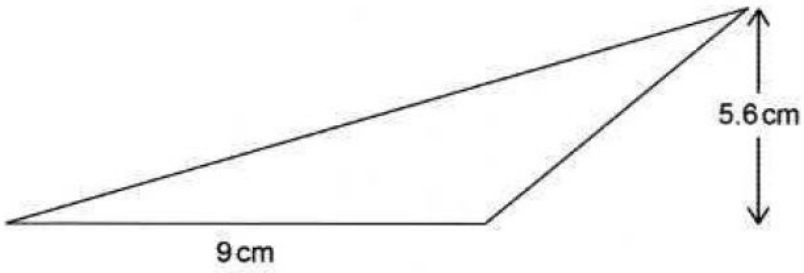
Commentary

The student has halved both dimensions, so this is an incorrect method.
0 marks

Student B

14 A triangle has base 9 cm and perpendicular height 5.6 cm

Not drawn accurately



Work out the area of the triangle. M 1

[2 marks]

$B \times h = 9 \times 5.6 = \frac{50.4}{2} = 25.2$

A 1

Answer 25.2 cm^2

Commentary

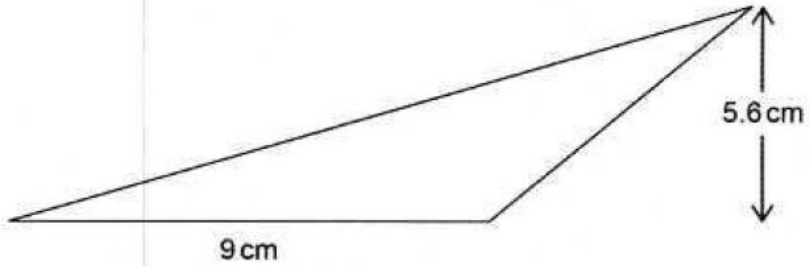
Although the equals signs are used incorrectly, the intention of the method can be followed and is equivalent.

2 marks

Student C

14 A triangle has base 9 cm and perpendicular height 5.6 cm

Not drawn accurately



Work out the area of the triangle. b x h ÷ 2

M 1 **[2 marks]**

9 x 56 = 504 ÷ 2 = 25.5

9

A 0

Answer 25.5 cm^2

Commentary

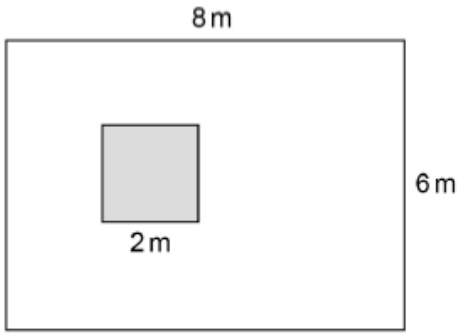
It is unclear whether it says 5.6 or 56 but the recovery to 50.4 implies the correct values were used. The method is correct but the student makes a slip in the final arithmetic, perhaps a miscopy from the calculator.

1 mark

Question 7

7 A rectangular carpet measures 8 m by 6 m

Part of the carpet is covered by a square rug of length 2 m



Not drawn accurately

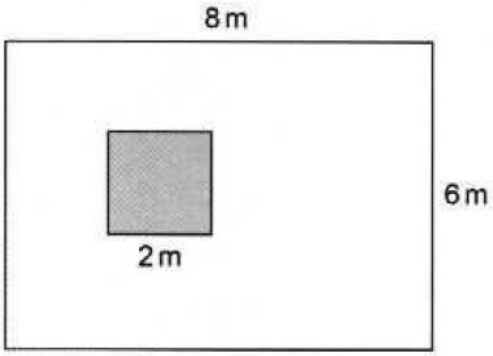
Show that $\frac{1}{12}$ of the carpet is covered by the rug.

[2 marks]

Student A

7 A rectangular carpet measures 8 m by 6 m

Part of the carpet is covered by a square rug of length 2 m



Not drawn accurately

Show that $\frac{1}{12}$ of the carpet is covered by the rug.

[2 marks]

8 × 6 = 48 - 48m

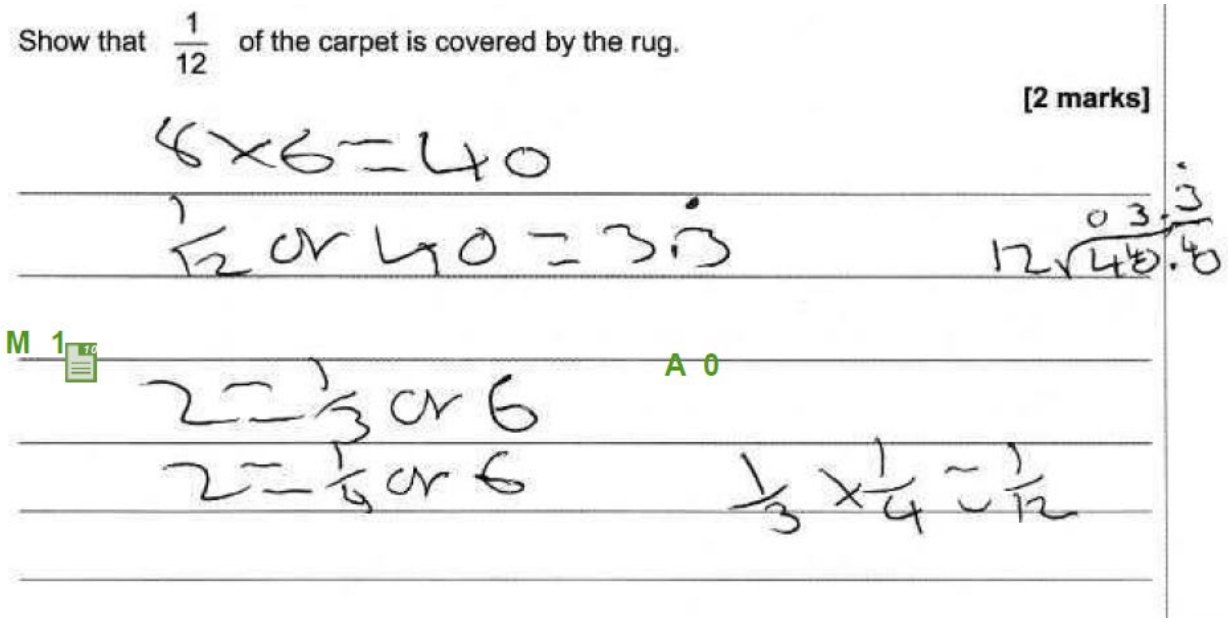
48 ÷ 2 = 24m

24 ÷ 2 = 12 - $\frac{1}{12}$ 2

Commentary

The student correctly works out the area of the carpet for the first mark. The second mark is awarded because this is equivalent to 48 ÷ 4 = 12 (see the right-hand side of the mark scheme).
2 marks

Student B



Commentary

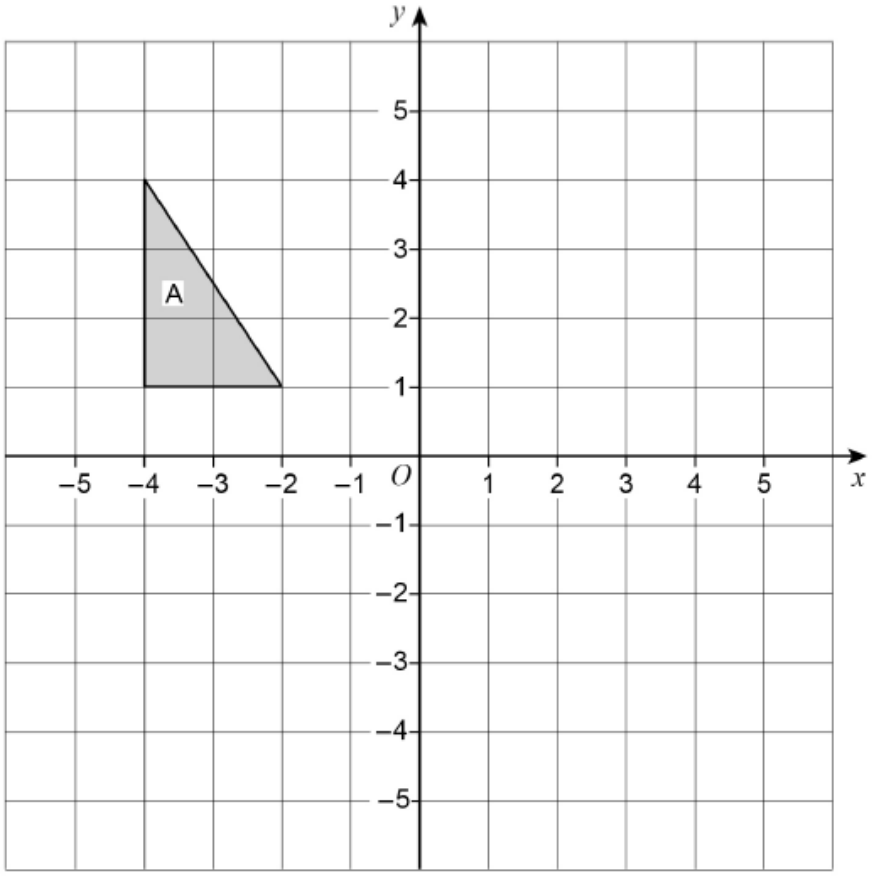
There is a choice of methods shown (lines 1 and 2 and lines 3 and 4). There is no answer line so we do not know which one the student wants us to mark. We mark both and award the lowest mark. The first method would score M1A0 for 8 × 6 but then an arithmetic error. The second method would also only score 1 mark because 2 is not a quarter of 6.

1 mark

Question 12

12 Reflect shape A in the x-axis.

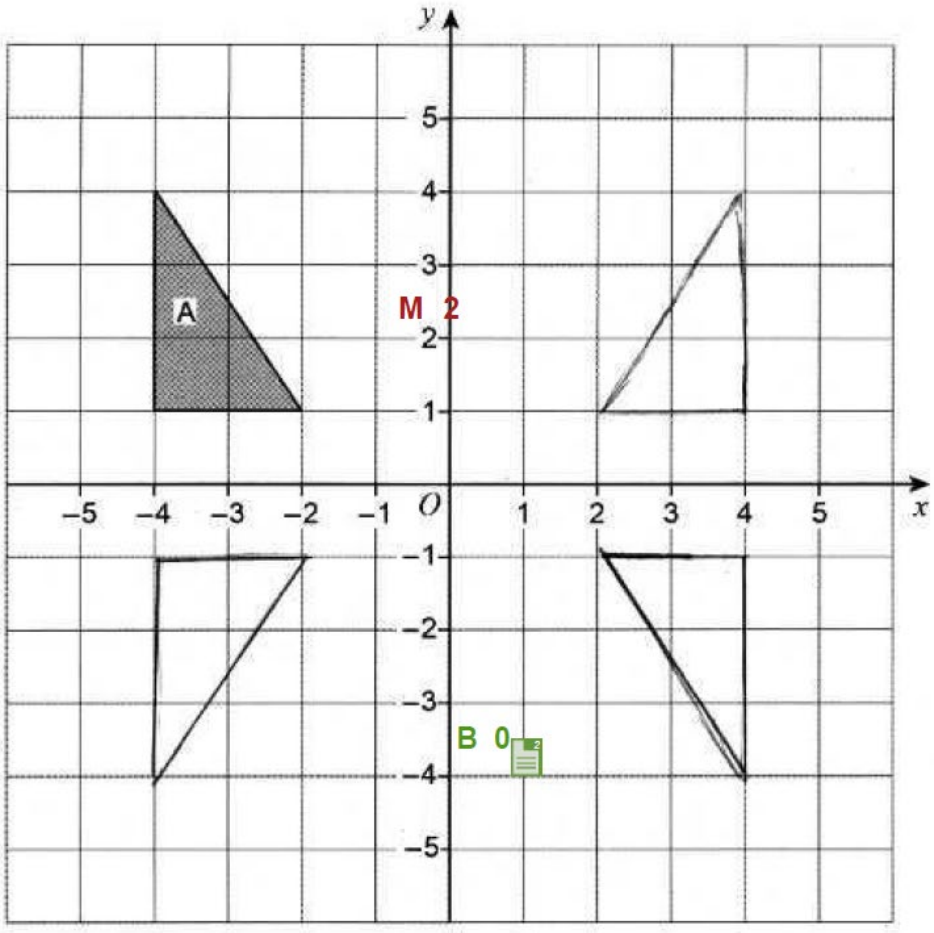
[2 marks]



Student A

12 Reflect shape A in the x-axis.

[2 marks]



Commentary

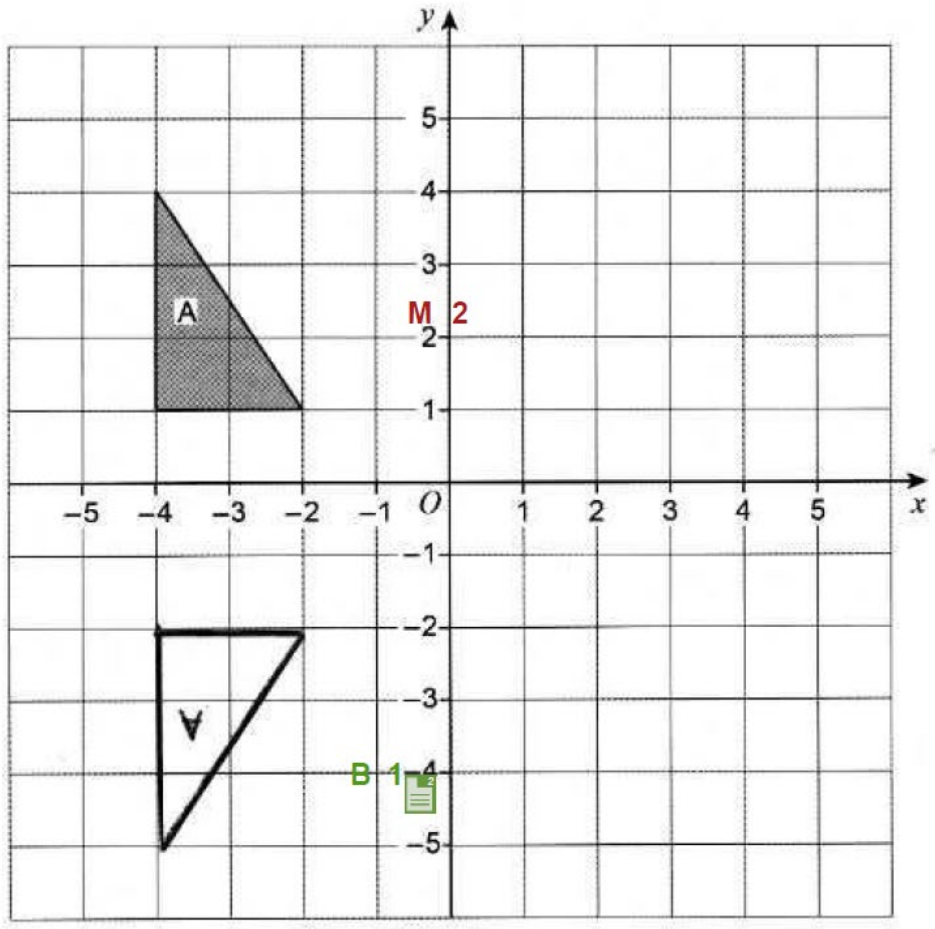
The student has given a choice of answers, so we mark them all and give the lowest score. The bottom left triangle is 2 marks, the top right is 1 mark and the bottom right is 0 marks.

0 marks

Student B

12 Reflect shape A in the x-axis.

[2 marks]



Commentary

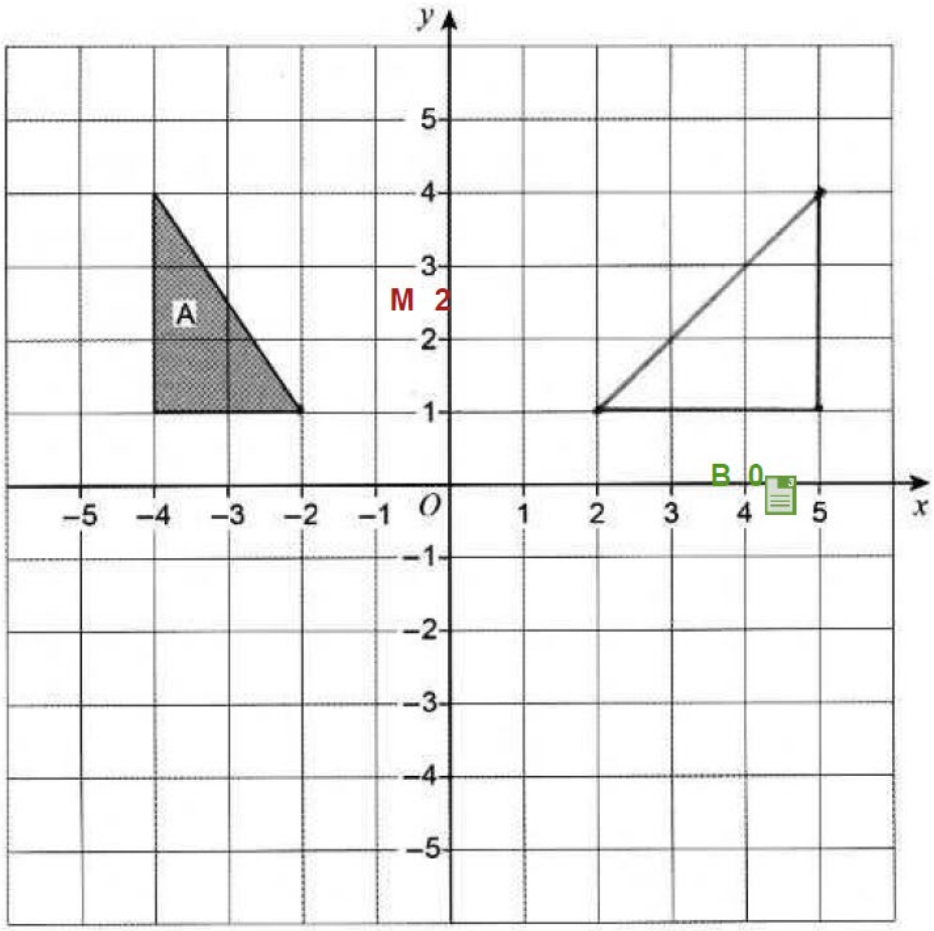
A reflection in any horizontal line scores 1 mark.

1 mark

Student C

12 Reflect shape A in the x-axis.

[2 marks]



Commentary

A reflection in the y-axis would score 1 mark but this student has made a mistake in the size of the triangle.

0 marks

Question 21 (a)

21 (a) A circle has radius 4.2 cm

Work out the length of the circumference.

Give your answer to 1 decimal place.

[3 marks]

Answer _____ cm

Student A

21 (a) A circle has radius 4.2 cm

Work out the length of the circumference.

Give your answer to 1 decimal place.

[3 marks]

$4.2 \times 2 = d = 8.4$

$d \times \pi = c$

$8.4 \times \pi = 26.3$

M 1 A 0

Answer 26.3 B 0 cm

Commentary

The correct method is shown for the first mark. However, the student does not show us a value to at least 2 decimal places and 26.3 is the incorrect answer so there are no more marks awarded.
1 mark

Student B

21 (a) A circle has radius 4.2 cm

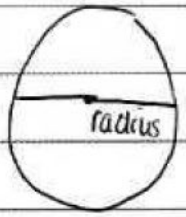
Work out the length of the circumference.

Give your answer to 1 decimal place.

[3 marks]

circumference = π diameter. =

8.4



M 1

A 1

Answer 26.4 cm

B 1

Commentary

Although the method and the full value is not shown, 26.4 is the correct answer so implies all three marks.

3 marks

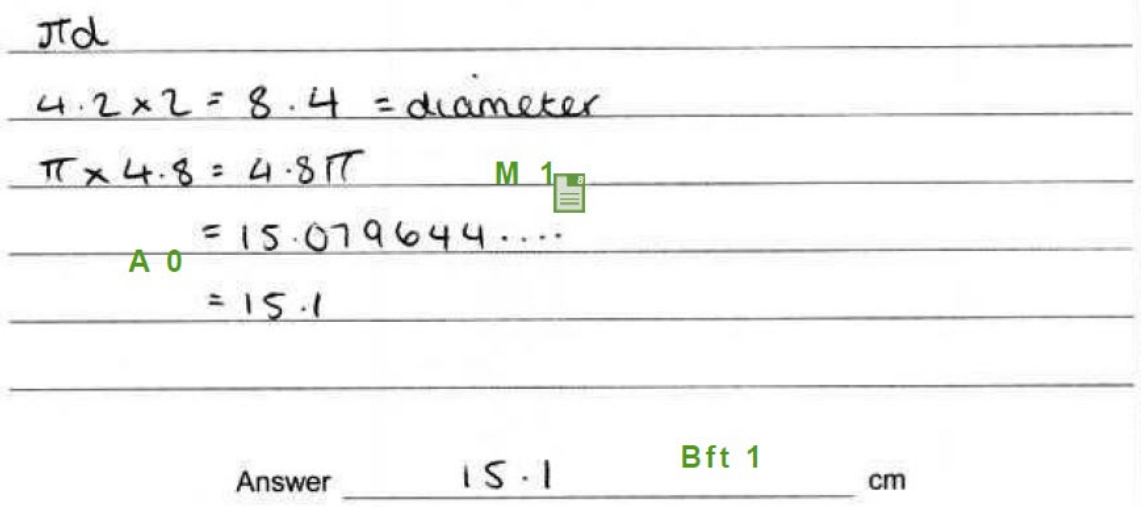
Student C

21 (a) A circle has radius 4.2 cm

Work out the length of the circumference.

Give your answer to 1 decimal place.

[3 marks]



Commentary

The student has made a transcription error writing 8.4 as 4.8 but we can see the correct intended method. The A mark will be lost as 15.079644… is incorrect but because enough of the decimal is shown we can see that this has been correctly rounded to 1 decimal place so the student can gain the follow through B mark.

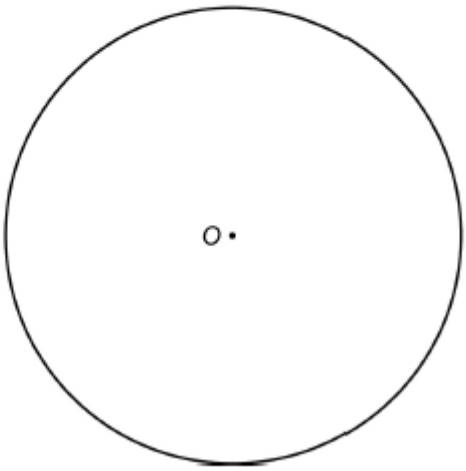
2 marks

Question 21 (b)

21 (b) The circle below has centre O.

Draw a sector on the circle.

[1 mark]

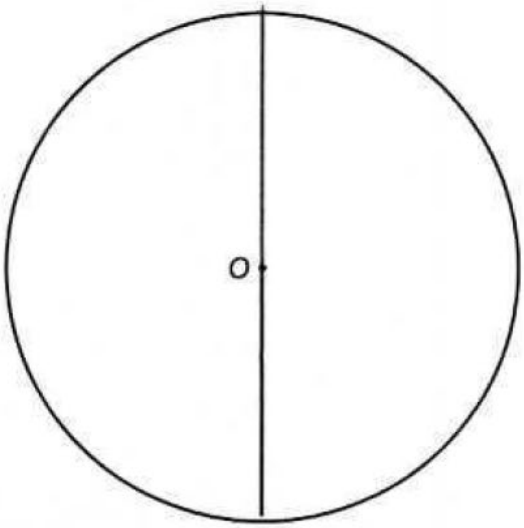


Student A

21 (b) The circle below has centre O.

Draw a sector on the circle.

[1 mark]



B 1

Commentary

The student splits the circle into two sectors with a diameter.

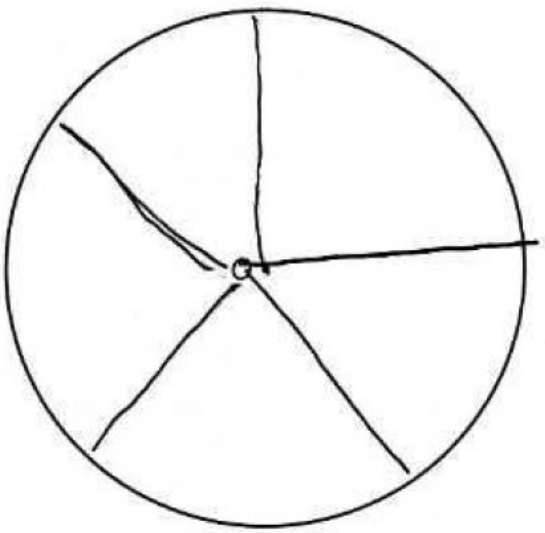
1 mark

Student B

21 (b) The circle below has centre O.

Draw a sector on the circle.

[1 mark]



B 1

Commentary

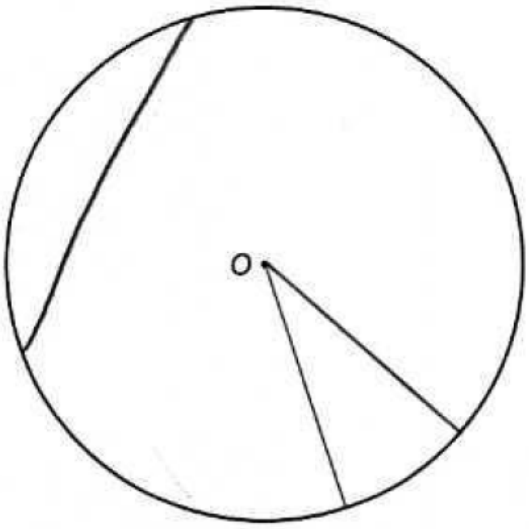
Multiple sectors are shown and the intention is clear.
1 mark

Student C

21 (b) The circle below has centre *O*.

Draw a sector on the circle.

[1 mark]



Commentary

There is a choice of answers with a segment and a sector shown.
0 marks

Question 14

Please see the mark scheme

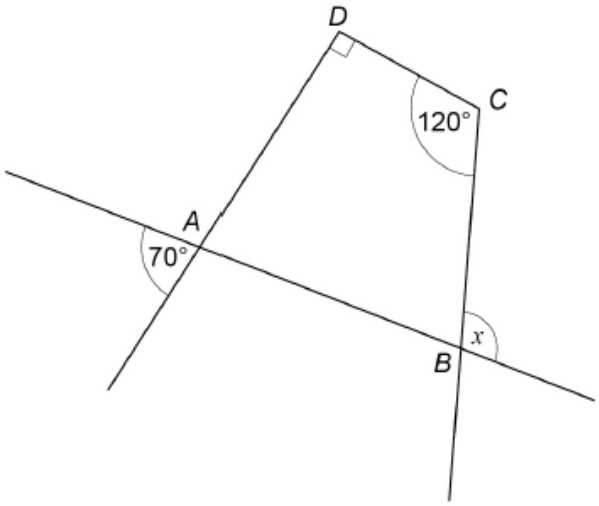
Question 16

No examples needed

Question 18

18 *ABCD* is a quadrilateral.

Sides are extended as shown.



Not drawn accurately

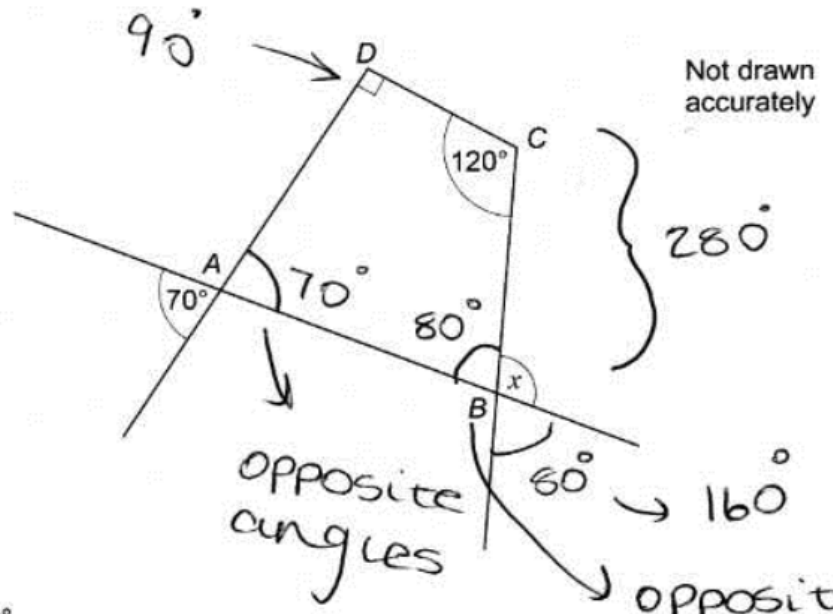
Show that $x = 100°$

[3 marks]

Student A

18 *ABCD* is a quadrilateral.

Sides are extended as shown.



Show that $x = 100°$ **[3 marks]**

1 90 + 120 + 70 = 280

2 360 − 280 = 080

360 − 160 = 200 ÷ 2 = 100

There is 360° around a point and 80 + 80 + 100 + 100 = 360°

Commentary

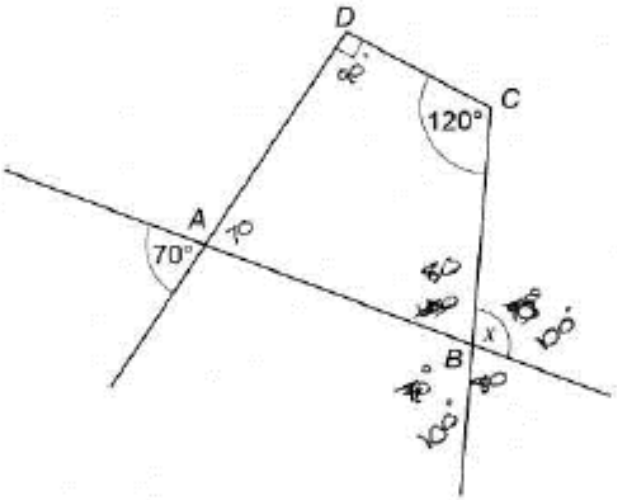
Angles *BAD* and *ABC* are correctly shown on the diagram for the first two marks. Then the student clearly shows that the angles around *B* sum to 360 degrees and gives a reason.

3 marks

Student B

18 *ABCD* is a quadrilateral.

Sides are extended as shown.



Not drawn accurately

Show that $x = 100°$

[3 marks]

160
120
90
350

120
90
70
280

360 - 280

360 -

110
120
90
70
390

110
110
220

360 - 220

50
70

100 ÷ 2 = 50

40 ÷ 2 = 20

300 - 260

286
300
360

20
80
100

60 = 20
40

= 100
80 + 80
160 + 200
= 360

A round point is 360°

100
120
90
70
380

80
120
90
76
360

Turn over for the next question

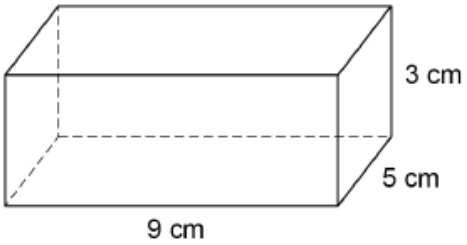
Commentary

Angles *BAD* and *ABC* are correctly shown on the diagram for the first two marks. However, the student has many attempts at summing various amounts but never shows the angles around *B* summing to 360 degrees to match the given reason.

2 marks

Question 22

22 Here is a cuboid.



The two **largest** faces are blue.

The other four faces are green.

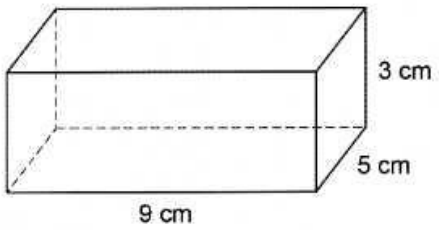
Is the total blue area greater than the total green area?

You **must** show your working.

[3 marks]

Student A

22 Here is a cuboid.



The two **largest** faces are blue.

The other four faces are green.

Is the total blue area greater than the total green area?

You **must** show your working.

[3 marks]

$9 \times 9 = 81 cm^2$

$5 \times 3 = 15 cm^2$

~~The Blue~~ The blue area is greater

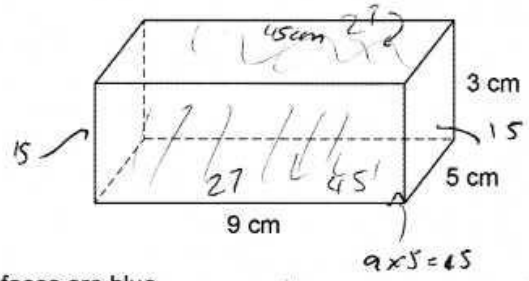
Commentary

Seeing the correct method or correct result for one face gains the first mark even if amongst other incorrect work. This response scores the first mark in line 2. However, the second mark is for correct methods for both the blue faces and green faces (or half totals).

1 mark

Student B

22 Here is a cuboid.



9 x 5 = 45
= base x height.

The two **largest** faces are blue.

The other four faces are green.

Is the total blue area greater than the total green area?

You **must** show your working.

[3 marks]

9 x 3 = 27cm 9 x 5 = 45.

5 x 3 = 15cm Blue: 45 + 45 = 90cm (total area)

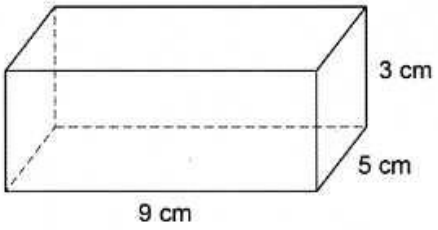
Green: 15 + 15 + 27 + 27 = 84cm (total area).

Commentary

The student has correctly worked out the surface areas of the blue and green faces but has not stated that blue is bigger or said Yes (underlining the 90 is ambiguous and insufficient).
NB Sometimes students answer the question up by the question mark.
2 marks

Student C

22 Here is a cuboid.



The two **largest** faces are blue.

The other four faces are green.

Is the total blue area greater than the total green area?

You **must** show your working.

[3 marks]

9 × 3 = 27 27 × 2 = 52

3 × 5 = 15 15 × 2 = 30

9 × 5 = 45 45 × 2 = 90

52 + 30 + 90 = 172 cm²

~~Blue faces~~

~~9 × 3 = 27 27 × 2 = 52~~ +

Blue faces

9 × 5 = 45 45 × 2 = 90 cm²

Green

9 × 3 = 27 27 × 2 = 52

3 × 5 = 15 15 × 2 = 30

52 + 30 = 82 cm²

The blue area is greater than the green area.

Commentary

All the method is correct, but the student has made an arithmetic slip when doubling 27. Because the method is shown the student still gains the first 2 marks.

2 marks

Question 22

No examples available

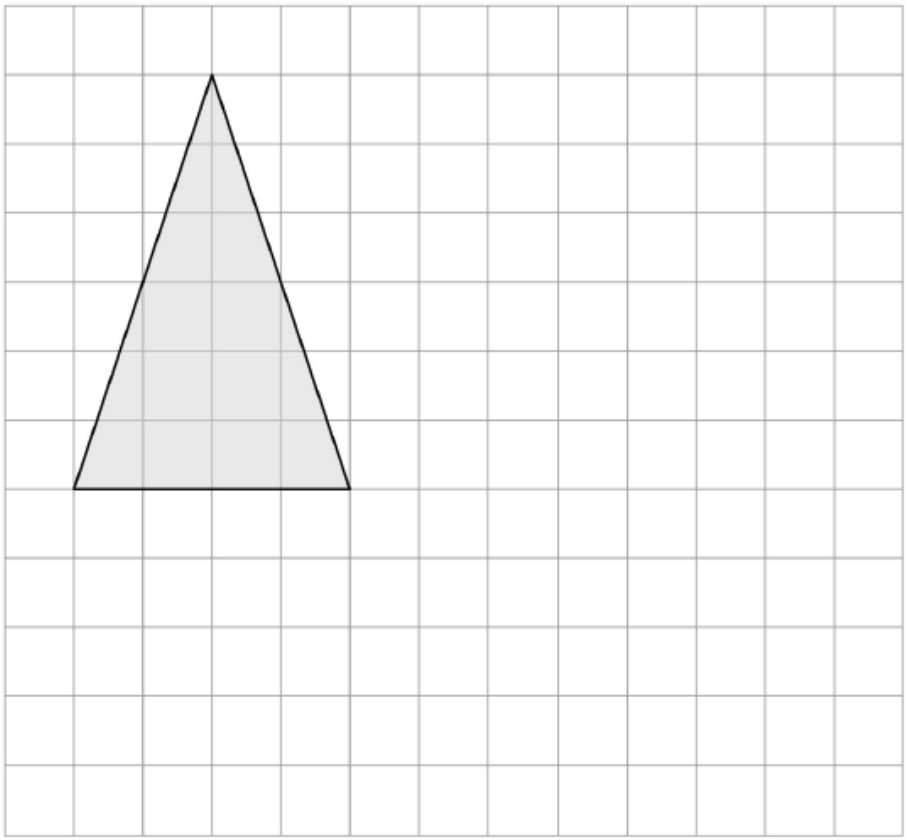
Commentary

If a student adds rather than subtracting the squares, then they can still gain one mark if 8^2 and 3^2 or 64 and 9 are seen. The second mark can be awarded if the student has evaluated one or both squares incorrectly but shown the method. For example, a student that writes $8^2 = 16$ and $3^2 = 6$ and then $\sqrt{10}$ will gain 2 marks because they are implying that they are attempting to work out $\sqrt{8^2 - 3^2}$.

Question 18

18 On the grid, draw an enlargement of the triangle with scale factor $\frac{1}{2}$

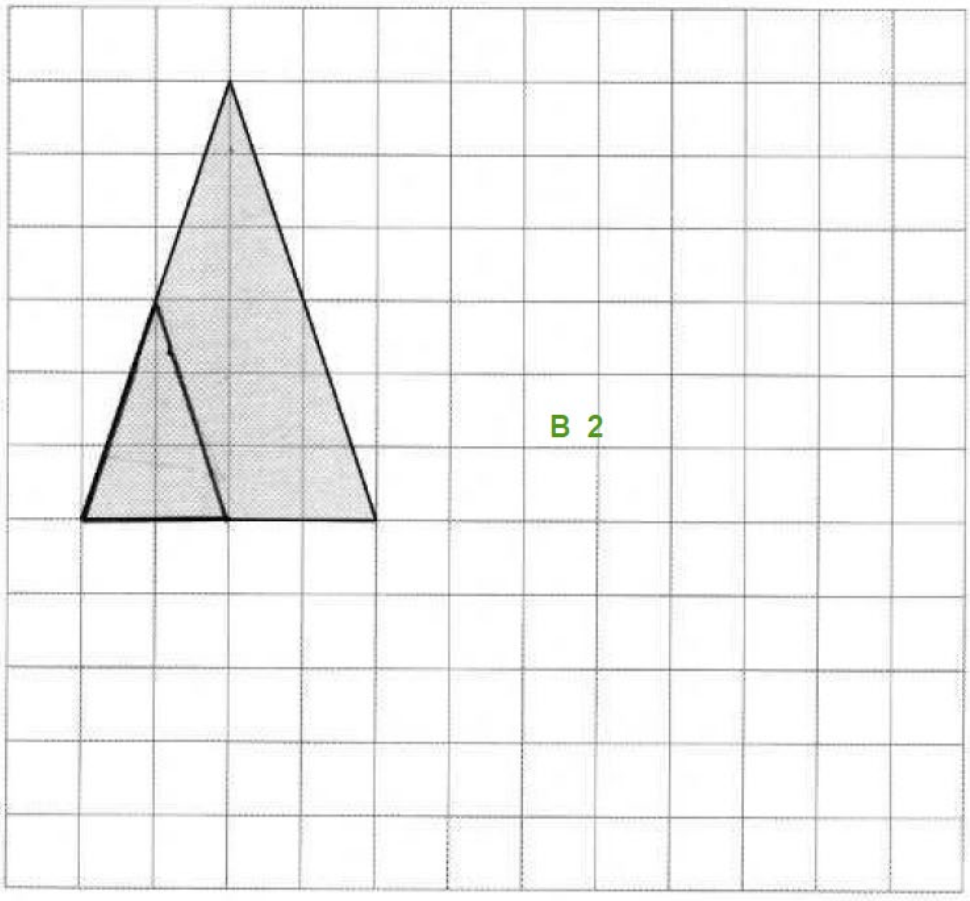
[2 marks]



Student A

18 On the grid, draw an enlargement of the triangle with scale factor $\frac{1}{2}$

[2 marks]



Commentary

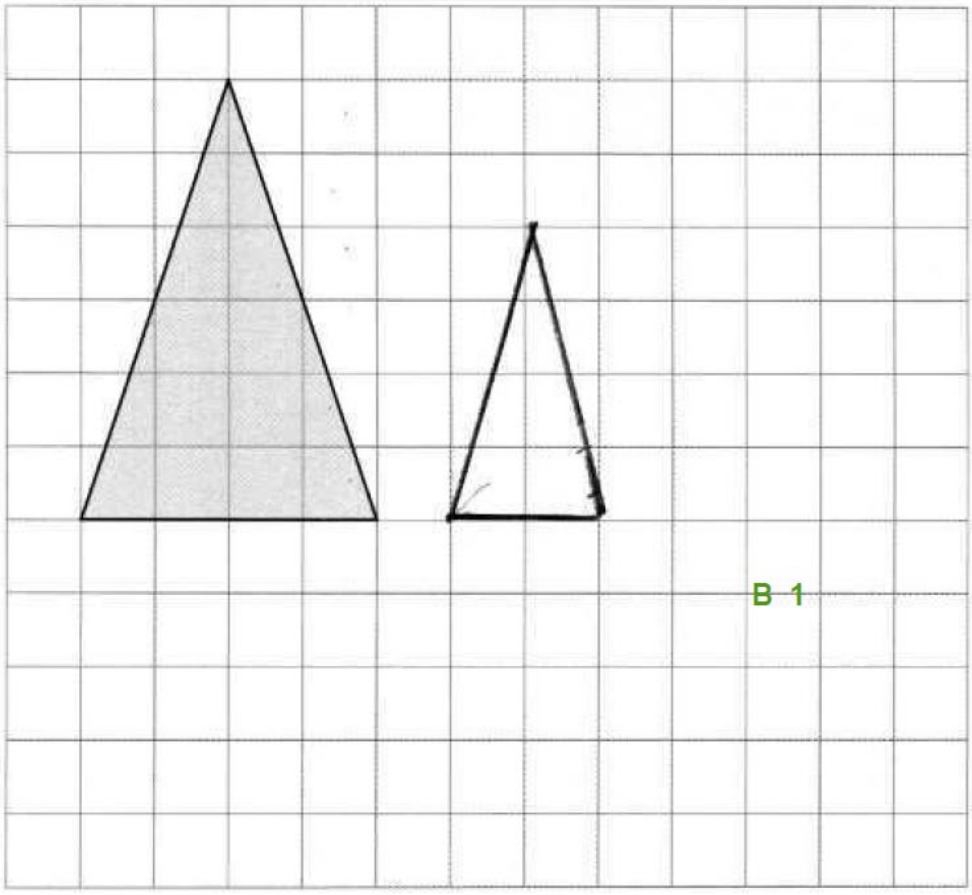
The enlargement is allowed to be fully or partially inside the original triangle.

2 marks

Student B

18 On the grid, draw an enlargement of the triangle with scale factor $\frac{1}{2}$

[2 marks]



Commentary

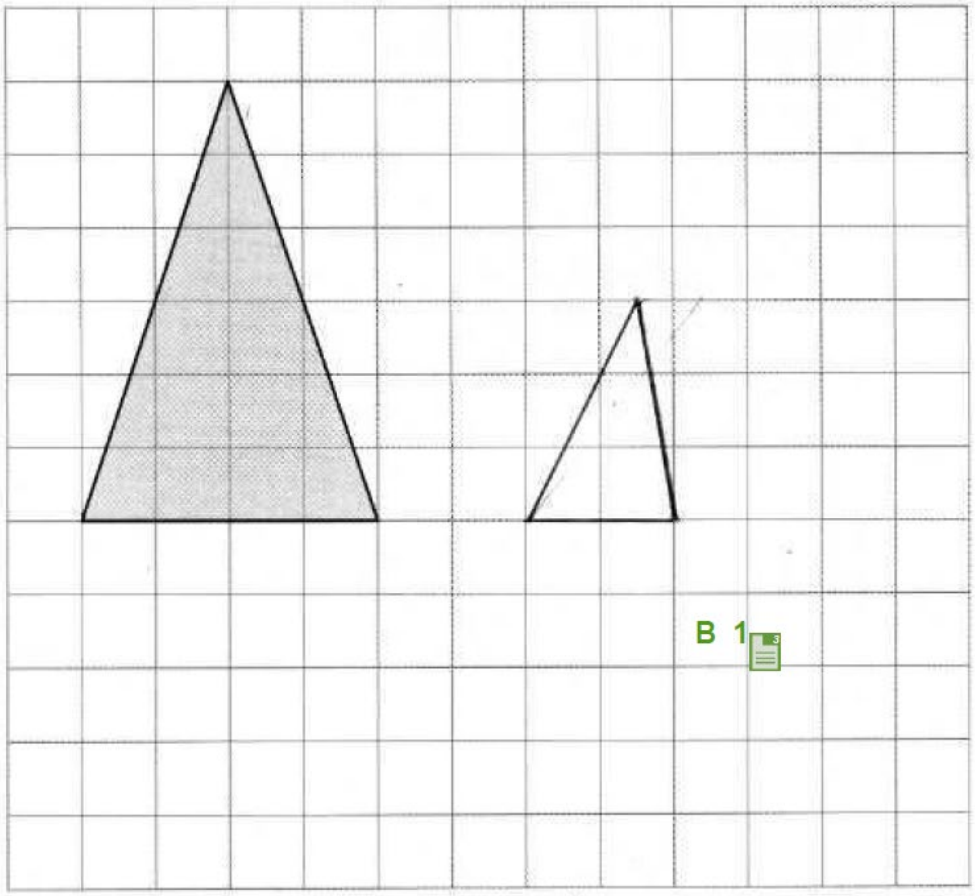
The student has drawn an isosceles triangle with the correct base even though the height is incorrect.

1 mark

Student C

18 On the grid, draw an enlargement of the triangle with scale factor $\frac{1}{2}$

[2 marks]



Commentary

The triangle is acute-angled but not isosceles and has base 2 cm and height 3 cm.
1 mark

Question 24

No examples available

Commentary

Please see the Additional Guidance for student responses.