OXFORD
INTERNATIONAL
AQA EXAMINATIONS

INTERNATIONAL GCSE MATHEMATICS

(9260)

Paper 2 Core

Example responses with commentary

For teaching from September 2016 onwards
For GCSE exams in May/June 2018 onwards

This guide includes some examples of student responses to a selection of questions from the summer 2018 Maths Paper 2C.

The question parts are reproduced, along with the final mark scheme, student responses and a commentary from the Lead Examiner on each of the students' answers.

QUESTION

08

8 During 2017, Vietnam had

a population of 95 000 000

one doctor for every 2300 people.

How many doctors did Vietnam have at this time?

Give your answer to 2 significant figures.

[3 marks]

Answer _____

MARK SCHEME

Q	Answer	Mark	Comments
8	95 000 000 ÷ 2300	M1	
	[41 304, 41305]	A1	may be implied by correct answer
	41 000	B1ft	ft any number >2sf rounded correctly to 2sf

STUDENT A

8 During 2017, Vietnam had
a population of 95 000 000
one doctor for every 2300 people.

How many doctors did Vietnam have at this time?
Give your answer to 2 significant figures.

[3 marks]

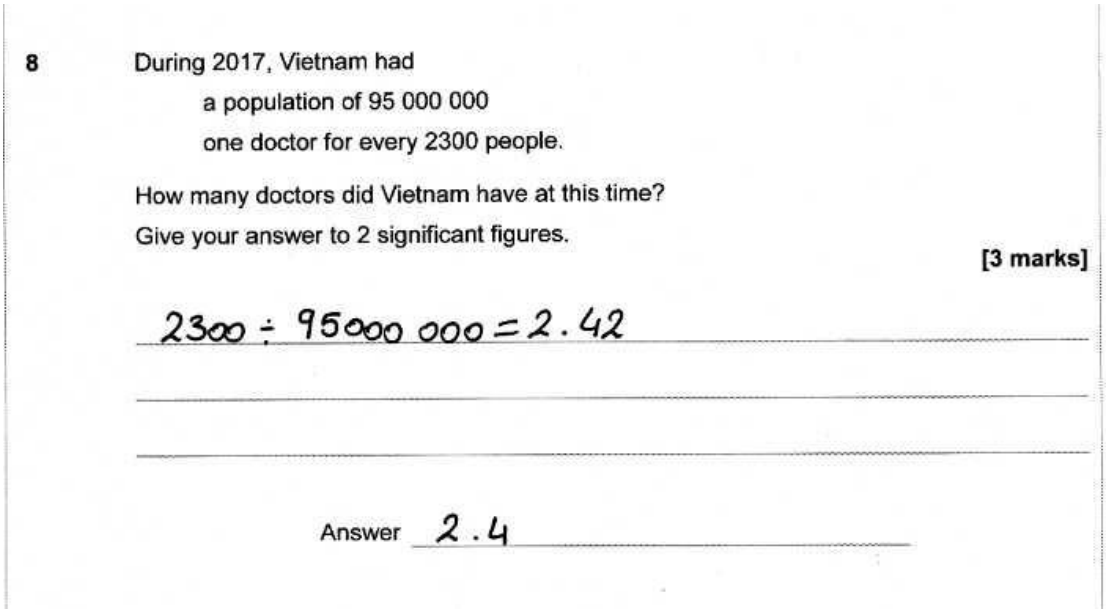
95000 000 ÷ 2300 = 41,304.35

Answer 41,304.35

EXAMINER COMMENTARY

The student has shown the correct calculation for the first mark and an accurate value for the second mark. However, the student has rounded to 2 decimal places rather than 2 significant figures so lost the final mark.
2 marks out of a possible 3 awarded.

STUDENT B



8 During 2017, Vietnam had
a population of 95 000 000
one doctor for every 2300 people.

How many doctors did Vietnam have at this time?
Give your answer to 2 significant figures.

[3 marks]

2300 ÷ 95000 000 = 2.42

Answer 2.4

EXAMINER COMMENTARY

The student has used an incorrect calculation so did not gain either of the first two marks. However, the third mark is an independent mark for any value with more than two significant figures rounded to two significant figures and the student has achieved this. It does not matter that the answer does not follow from the calculation, but it is vital that the rounding must be shown as it is here.
1 mark out of a possible 3 awarded.

QUESTION

10

10 Work out $\frac{3}{4} + \frac{7}{11}$

Give your answer as a mixed number.

You **must** show your working.

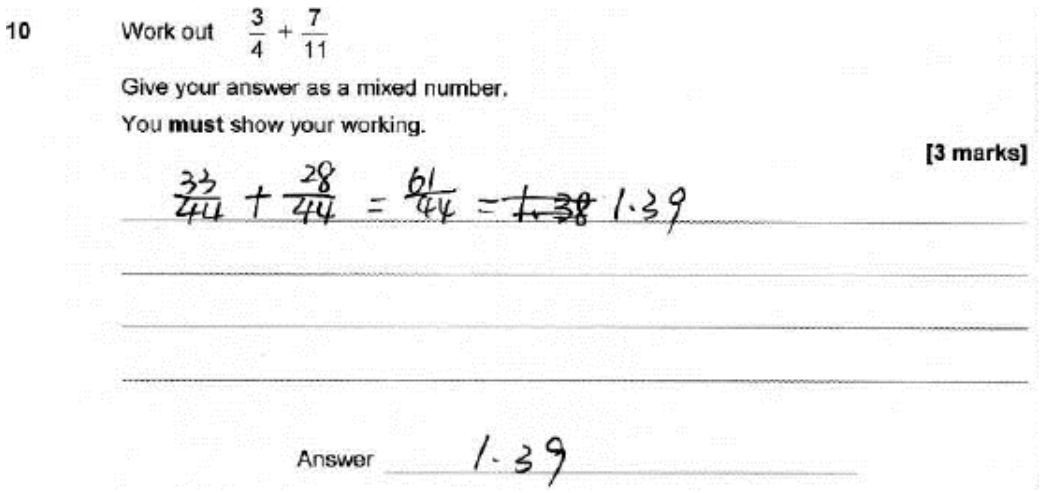
[3 marks]

Answer _____

MARK SCHEME

Q	Answer	Mark	Comments
10	$\frac{33}{44}$ and $\frac{28}{44}$	M1	oe common denominator with at least one numerator correct
	$\frac{61}{44}$ with correct working seen	A1	oe fraction
	$1\frac{17}{44}$ with correct working seen	A1 ft	ft their improper fraction correctly converted with M1 awarded
	Additional Guidance		
	Working in decimals scores M0A0 unless recovered		

STUDENT A



10 Work out $\frac{3}{4} + \frac{7}{11}$

Give your answer as a mixed number.

You **must** show your working.

[3 marks]

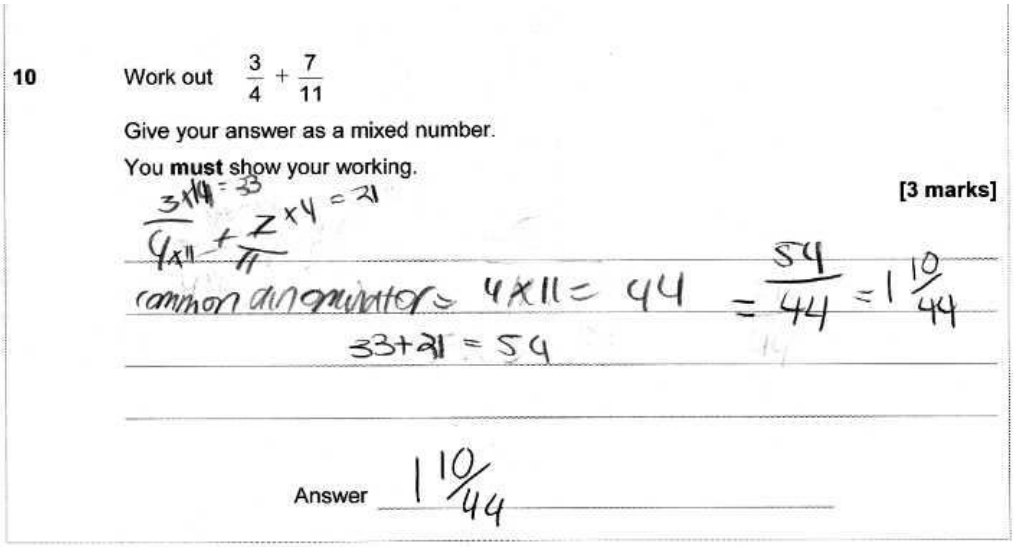
$\frac{33}{44} + \frac{28}{44} = \frac{61}{44} = ~~1.38~~ 1.39$

Answer 1.39

EXAMINER COMMENTARY

The student has worked out the correct improper fraction and shown the required working of the two fractions with a common denominator, so has been awarded the first two marks. However, the student has misunderstood the term 'mixed number' and given the answer as a decimal rather than an integer with a proper fraction.
2 marks out of a possible 3 awarded.

STUDENT B



10 Work out $\frac{3}{4} + \frac{7}{11}$

Give your answer as a mixed number.

You **must** show your working.

[3 marks]

$\frac{3 \times 11 = 33}{4 \times 11} + \frac{7 \times 4 = 21}{11}$

common denominator = $4 \times 11 = 44$ $= \frac{54}{44} = 1\frac{10}{44}$

$33 + 21 = 54$

Answer $1\frac{10}{44}$

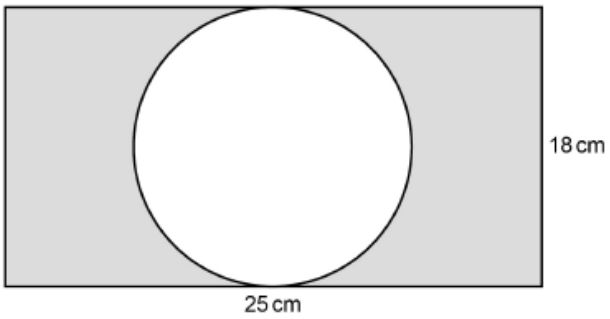
EXAMINER COMMENTARY

Although the working is not very easy to follow and slightly unconventional, an attempt to use a common denominator of 44 with one correct numerator can be seen for the first mark. The student has made an arithmetic error of 7 × 4 = 21 which resulted in an incorrect improper fraction so the second mark was lost. As the first mark was awarded, and sufficient working has been seen, the final follow through mark for conversion to a mixed number has been achieved.
2 marks out of a possible 3 awarded.

QUESTION

14

14 A circle is cut out of a rectangular piece of card as shown.



Work out the shaded area.

[3 marks]

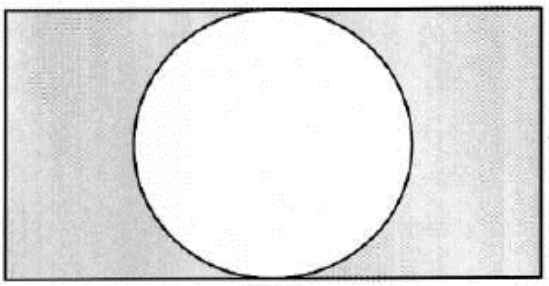
Answer _____ cm^2

MARK SCHEME

Q	Answer	Mark	Comments
14	25 × 18 or 450	M1	
	$\pi \times (18 \div 2)^2$ or [254.3, 254.502]	M1	
	[195,196] or $450 - 81\pi$	A1	

STUDENT A

14 A circle is cut out of a rectangular piece of card as shown.



Work out the shaded area. **[3 marks]**

$18 \times 25 = 5450 \text{ cm}^2$

$18 \div 2 = 9 \text{ cm}$ $\pi 9^2 =$

$5450 - \pi 9^2 = 5195.531$

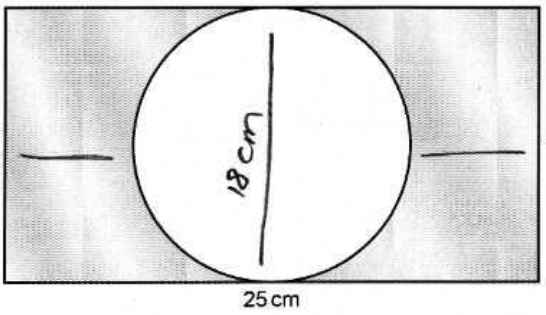
Answer 5195.531 cm^2

EXAMINER COMMENTARY

The student has shown the correct method to work out the area of the rectangle so, even though the wrong evaluation is given, the student has been awarded the first mark. The correct method for the area of the circle is seen to gain the second mark. The final answer is incorrect, despite a fully correct method. This demonstrates the importance of showing working because the final answer alone would have scored 0.
2 marks out of 3 awarded.

STUDENT B

14 A circle is cut out of a rectangular piece of card as shown.



Not drawn accurately

Work out the shaded area.

[3 marks]

$25 \times 18 = 450$

$\pi \times 18 = 56.54866776$

$450 - 57 = 393$

Answer 393 cm^2

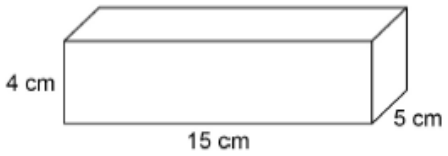
EXAMINER COMMENTARY

The student has worked out the area of the rectangle correctly for the first mark. However, as with many of the weaker responses, the student has used the formula for the circumference rather than the area of a circle and so has made no further progress.
1 mark out of a possible 3 awarded.

QUESTION

16

16 The base of a cuboid is a 15 cm by 5 cm rectangle.



The top and base of the cuboid are red.

The other four faces are blue.

Show that **more than** half of the total surface area is blue.

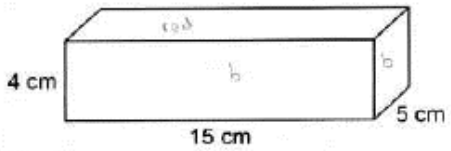
[4 marks]

MARK SCHEME

Q	Answer	Mark	Comments
16	15 × 5 (× 2) or 75 (× 2) or 150	M1	
	4 × 15 or 60 or 4 × 5 or 20	M1	
	4 × 15 (× 2) + 4 × 5 (× 2) or 160 or 80 or 4 × 15 (× 2) + 4 × 5 (× 2) + 5 × 5 (× 2) or 155 or 310	M1 dep	dep on previous M
	150 red and 160 blue or 155 < 160 or 155 > 150 or 0.51 or 0.52 or 75 and 80 or $\frac{160}{310}$ = 0.51(61…) > 0.5	A1	
	Additional Guidance		
	ignore cm^3		
	310 implies M3		

STUDENT A

16 The base of a cuboid is a 15 cm by 5 cm rectangle.



The top and base of the cuboid are red.
The other four faces are blue.

Show that **more than** half of the total surface area is blue.

[4 marks]

red : 15 x 5 x 2 = 150 cm²

blue : (15 x 4 x 1) + (5 x 4 x 1) = 160

150 + 160 = 310

Half of total : 310 ÷ 2 = 155

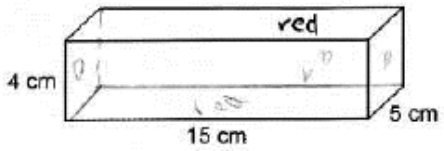
160 > 155

EXAMINER COMMENTARY

The student has worked out the total red area and the total blue areas and then compared the blue area with half of the total surface area. This is an excellent example of an accurate and thorough argument.
4 marks out of a possible 4 awarded.

STUDENT B

16 The base of a cuboid is a 15 cm by 5 cm rectangle.



The top and base of the cuboid are red.

The other four faces are blue.

Show that **more than** half of the total surface area is blue.

[4 marks]

Red = 15 x 5 = 75 → 75 x 2 = 150

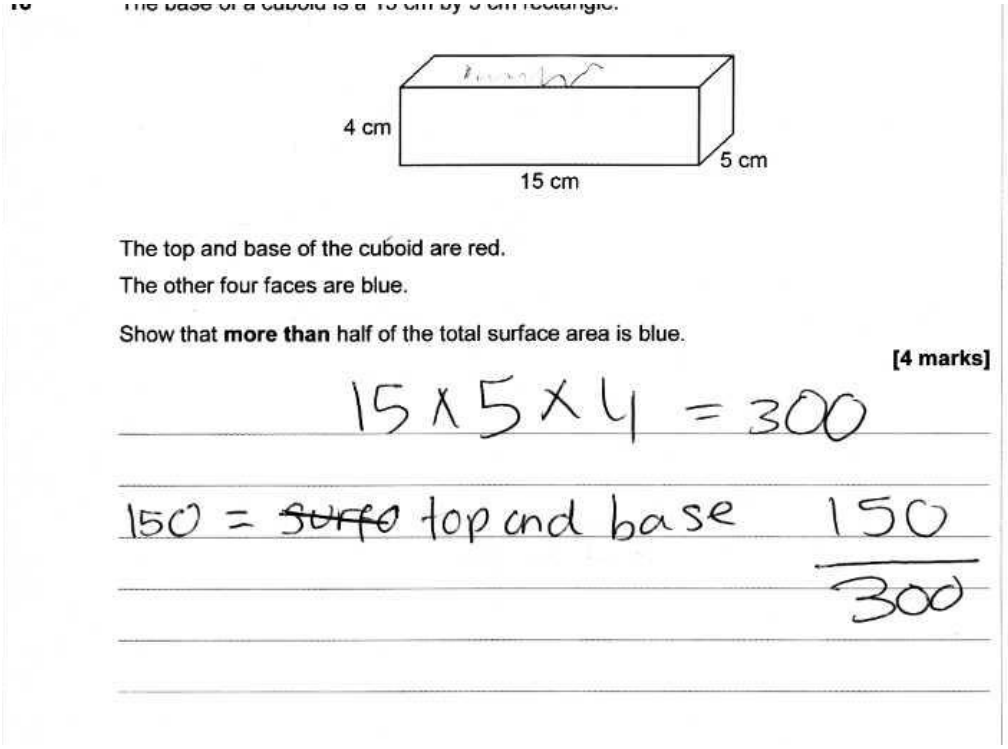
blue = 1). 5 x 4 = 20 → 20 x 2 = 40

2). 15 x 4 = 60 → 60 x 2 = 120

EXAMINER COMMENTARY

The student has worked out the total red area for the first mark. The second mark was for either blue face so this was also awarded. Had the student totaled the 40 and the 120 to give the total blue area this would have gained the third mark and, potentially, the fourth because the areas have been labelled red and blue. This student did not have very far to go to complete the solution.
2 out of a possible 4 marks awarded.

STUDENT C



EXAMINER COMMENTARY

The student has worked out the volume of the cuboid which was a fairly common misconception among weaker students. However, the total red area has also been calculated and this does gain the first mark.
1 mark out of a possible 4 awarded.

QUESTION

20 (b)

20 (b) Towns A, B and C lie in a straight line.

B lies between A and C.

A and B are 5 cm apart on the map.

The actual distance from A to C is 8 km

Show that B and C are **less than** 12 cm apart on the map.

[3 marks]

MARK SCHEME

Q	Answer	Mark	Comments
20(b)	**Alternative method 1**		
	8 – 0.5 × 5 or 5.5	M1	oe
	their 5.5 × 100 000 ÷ 50 000	M1 dep	
	11	A1	
	Alternative method 2		
	8 × 100 000 ÷ 50 000 or 16	M1	
	their 16 – 5	M1 dep	
	11	A1	
	Alternative method 3		
	12 + 5 or 17	M1	
	17 × 0.5	M1 dep	
	8.5	A1	

STUDENT A

20 (b) Towns A, B and C lie in a straight line.

B lies between A and C.

A and B are 5 cm apart on the map.

The actual distance from A to C is 8 km

Show that B and C are **less than** 12 cm apart on the map.

[3 marks]

~~5cm 5×0.5 = 2.5km~~ , 8÷0.5 = 16cm

16cm − 5cm = 11cm

EXAMINER COMMENTARY

Students that used this method generally were more successful because there was only one conversion (8 km to cm) necessary. This student has correctly converted the 8 km for the first mark. The second mark is gained for the subtraction and the final mark for completing the solution accurately. It is often a good exercise for students to review solutions using different methods and discuss which method is likely to be more straightforward.
3 marks out of a possible 3 awarded.

STUDENT B

20 (b) Towns A, B and C lie in a straight line.

B lies between A and C.

A and B are 5 cm apart on the map.

The actual distance from A to C is 8 km

Show that B and C are **less than** 12 cm apart on the map.

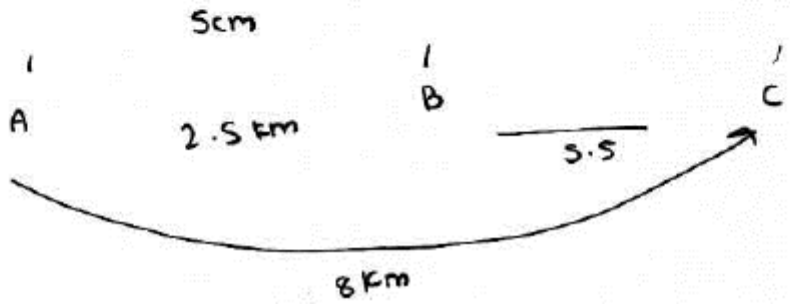
[3 marks]

A to B = 2.5 km = 5 cm

A to C = 8 km = 16 cm

B and C = 8 − 2.5 = 5.5 cm

less than 12 cm apart



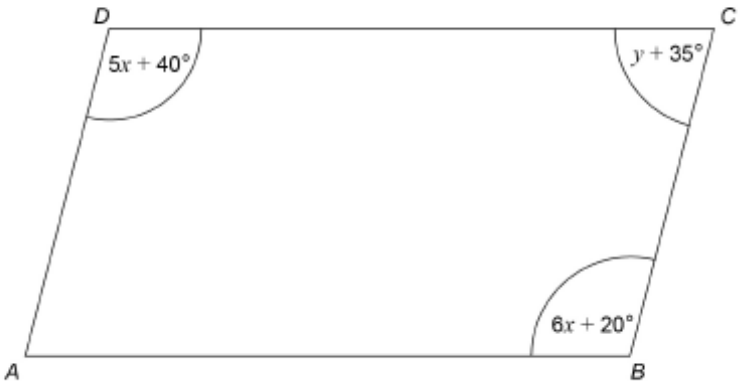
EXAMINER COMMENTARY

The student has correctly worked out that 5 cm is 2.5 km and subtracted that from the 8 km to work out *BC* = 5.5 which gained the first mark. 5.5 cm rather than 5.5 km was condoned, especially as the method clearly showed the intention. It was common to see many students that used this method fail to realise that 5.5 and 12 were in different units so one had to be converted in order to compare them.
1 mark out of a possible 3 awarded.

QUESTION

26

26 *ABCD* is a parallelogram.



Not drawn accurately

Work out x and y.

[5 marks]

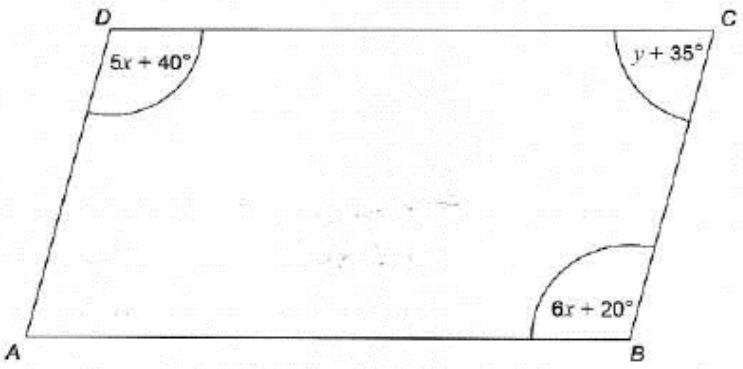
$x =$ _____ ° $y =$ _____ °

MARK SCHEME

Q	Answer	Mark	Comments
26	$5x + 40 = 6x + 20$	M1	
	$x = 20$	A1	
	$5x + 40 + y + 35 = 180$ or 5 × their 20 + 40 + y + 35 = 180 or $6x + 20 + y + 35 = 180$ or 6 × their 20 + 20 + y + 35 = 180 or $5x + 40 + y + 35 + 6x + 20 + y + 35 = 360$ or $2 \times (y + 35) = 80$	M1	oe
	$y = 180 – 40 – 35 – 5 \times$ their 20 or $2y = 360 – 40 – 35 – 20 – 35 – 11 \times$ their 20 or $y + 35 = 40$ or $y = 180 – 20 – 35 – 6 \times$ their 20	M1dep	oe
	$y = 5$	A1	

STUDENT A

26 *ABCD* is a parallelogram.



Not drawn accurately

Work out x and y.

[5 marks]

Because ABCD is a parallelogram, so ∠A = ∠C ; ∠D = ∠B ; ∠A + ∠B = 180°

5x + 40° = 6x + 20°

−x = −20°

x = 20°

6x + 20° + ∠A = 180°

6 × 20° + ∠A = 180°

120° + ∠A = 180°

∠A = 60°

y + 35° = 60°

y = 25°

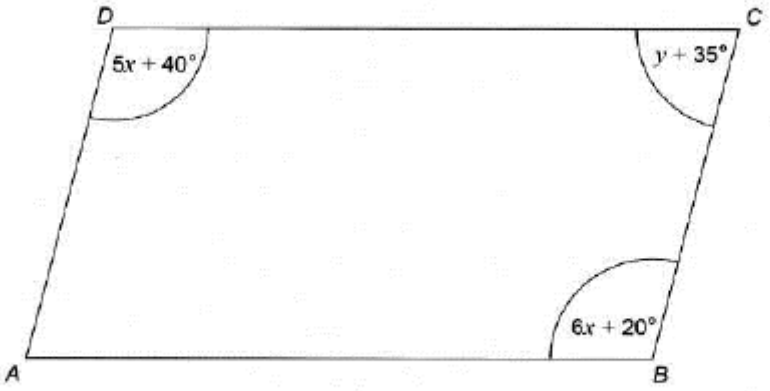
$x =$ 20 ° $y =$ ~~60~~ 25 °

EXAMINER COMMENTARY

The student has correctly equated opposite angles for the first mark and then solved the equation for the second mark. The student has miscopied their own work and $6x + 20$ has become 6×20 (in the highlighted box). The examiner has given the benefit of the doubt that the intended method is correct and would have led to the correct value of y had the slip not been made.
4 marks out of a possible 5 awarded.

STUDENT B

26 *ABCD* is a parallelogram.



Not drawn accurately

Work out x and y. **[5 marks]**

$6x + 20 = 5x + 40$

$-5x$

$x + 20 = 40$

-20

$x = 20$

$x = 20$ ° $y =$ ____ °

EXAMINER COMMENTARY

The student has used the fact that the opposite angles are equal to form an equation and then solved it to work out the value of x. However, the student has not carried on to use the fact that the interior angles sum to 180° to form an equation in y. Interestingly, some students did not understand about opposite angles but did understand interior angles and were also able to score two marks.
2 marks out of a possible 5 awarded.

QUESTION

29

29 The cost of a repair to a car is $245.74

Muhammad and Adam share this cost in the ratio 4 : 7

Muhammad has 10 000 yen.

$1 = 110 yen

Can Muhammad pay his share of the cost?

You **must** show your working.

[4 marks]

Answer _____

MARK SCHEME

Q	Answer	Mark	Comments
29	**Alternative method 1**		
	245.74 ÷ (4 + 7) or 22.34	M1	M2 $245.74 \times \frac{4}{11}$
	their 22.34 × 4 or 89.36	M1 dep	
	their 89.36 × 110 or 9829.6	M1	oe
	9829.6 and Yes	A1	accept 9829 or 9830
	Alternative method 2		
	245.74 ÷ (4 + 7) or 22.34	M1	M2 $245.74 \times \frac{4}{11}$
	their 22.34 × 4 or 89.36	M1 dep	
	10 000 ÷ 110 or 90.9 or 91	M1	
	90(.9) and 89.36 and Yes	A1	accept 91

STUDENT A

29 The cost of a repair to a car is $245.74

Muhammad and Adam share this cost in the ratio 4 : 7

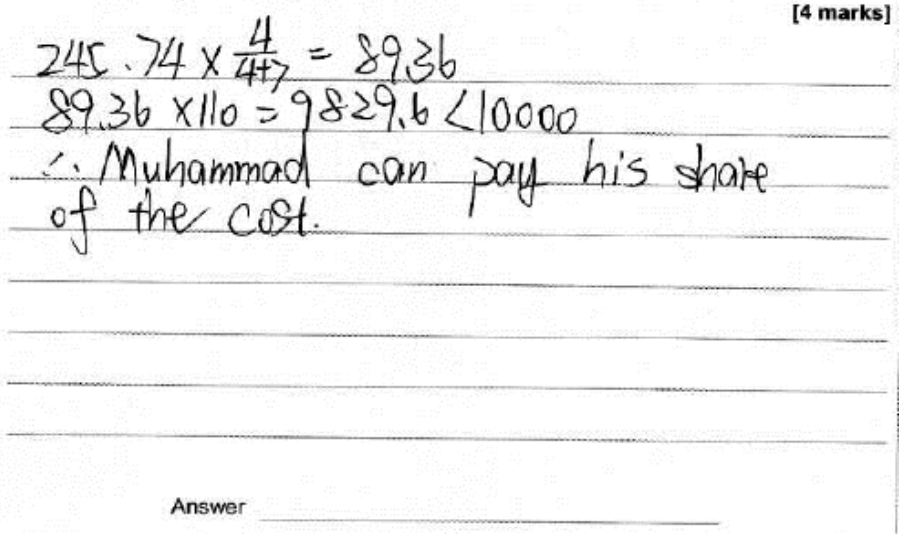
Muhammad has 10 000 yen.

$1 = 110 yen

Can Muhammad pay his share of the cost?

You **must** show your working.

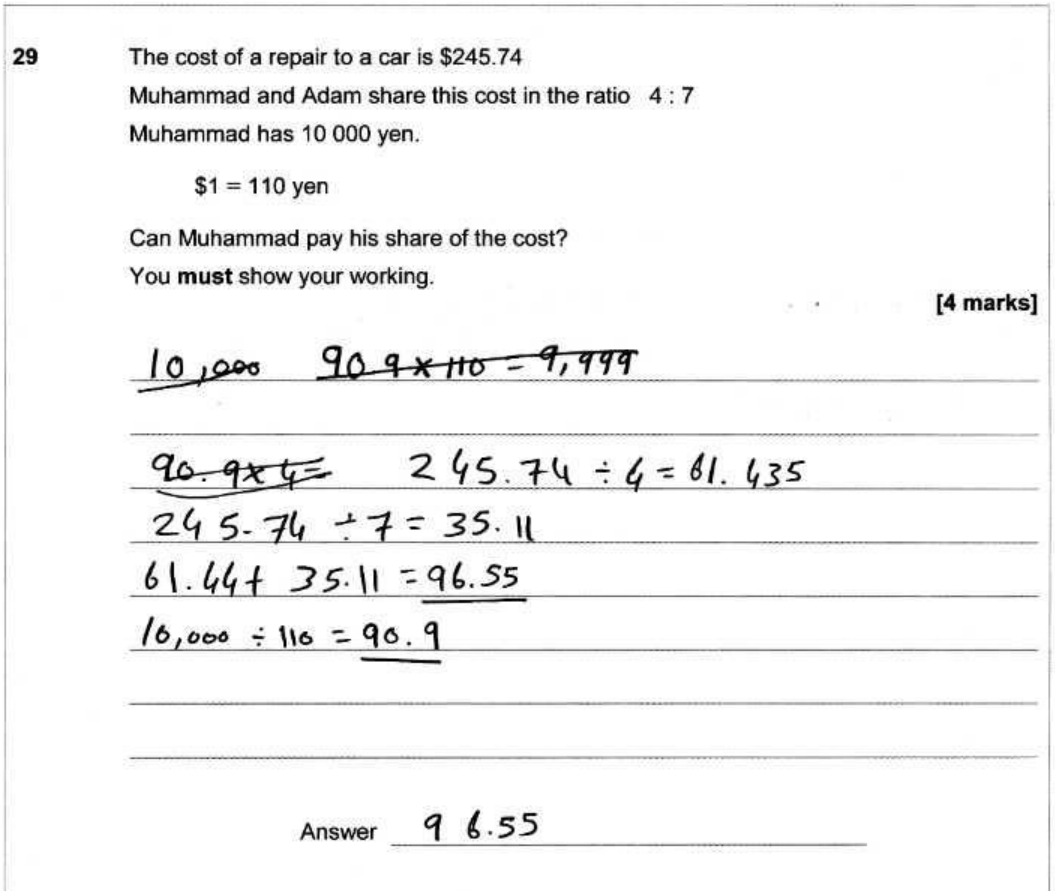
[4 marks]



EXAMINER COMMENTARY

The student has used the ratio correctly: dividing by 11 gained the first mark and multiplying by 4 the second mark. The student then had the option of converting their dollars to yen or 10 000 yen to dollars and has chosen the first option. The correct value is calculated and the student has given a clear equivalent to 'Yes'.
4 marks out of a possible 4 awarded.

STUDENT B



29 The cost of a repair to a car is $245.74
Muhammad and Adam share this cost in the ratio 4 : 7
Muhammad has 10 000 yen.

$1 = 110 yen

Can Muhammad pay his share of the cost?
You **must** show your working.

[4 marks]

10,000 ~~90.9 × 110 = 9,999~~

~~90.9 × 4 =~~ 245.74 ÷ 4 = 61.435
245.74 ÷ 7 = 35.11
61.44 + 35.11 = 96.55
10,000 ÷ 110 = 90.9

Answer 96.55

EXAMINER COMMENTARY

The student has used the ratio incorrectly. It was common to see weaker students dividing by 4 but this student has divided by 4 and by 7 and then added so the first two marks were lost. The conversion mark was still available for changing their dollars to yen or 10 000 yen to dollars. This student has shown the correct method for converting the 10 000 yen to dollars and has gained the third mark.
1 mark out of a possible 4 awarded.

FURTHER GUIDANCE AND CONTACTS

You can contact the subject team directly at **english@oxfordaqaexams.org.uk**

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