Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2019

# Mathematics

StemUp Model Solution

Unit M5 Paper 1
**(Non-Calculator)**
Foundation Tier



**[GMC51]**

*GMC51*

**THURSDAY 6 JUNE, 9.15am–10.15am**

**TIME**

1 hour.

**INSTRUCTIONS TO CANDIDATES**

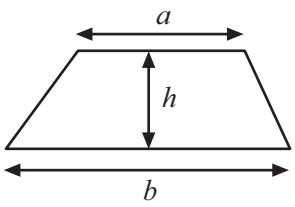
Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
**You must answer the questions in the spaces provided.**
**Do not write outside the boxed area on each page, on blank pages or tracing paper.**
Complete in black ink only. **Do not write with a gel pen.**
Answer **all sixteen** questions.
All working should be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions.
You **must not** use a calculator for this paper.

**INFORMATION FOR CANDIDATES**

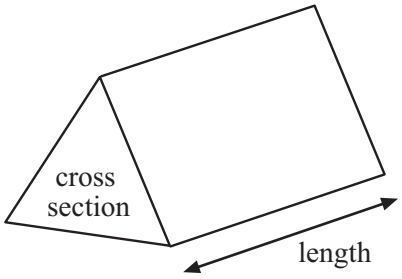
The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a ruler, compasses and a protractor.
The Formula Sheet is on page 2.

# Formula Sheet

**Area of trapezium** $= \frac{1}{2}(a + b)h$




**Volume of prism** = area of cross section × length




11941

**1** Michael wants to estimate his mobile phone charges.

19 minutes of calls at 3p per minute
21 texts at 5p per text
37 MB of data at 2p per MB

**Estimate** the total cost of the charges.

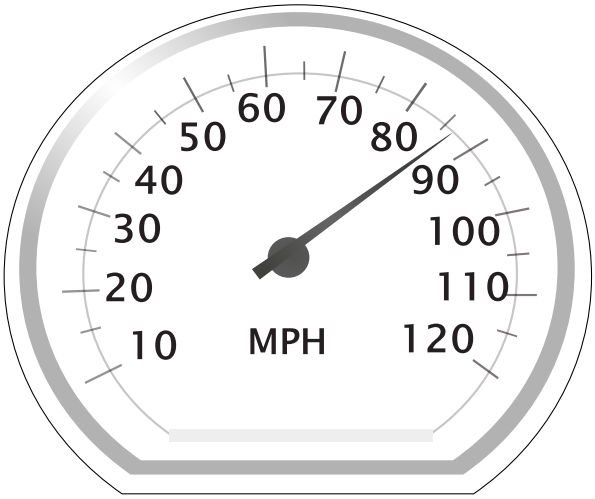
Show your method.

19 ≈ 20, 21 ≈ 20, 37 ≈ 40
Calls: 20 × 3p = 60p
Texts: 20 × 5p = 100p
Data: 40 × 2p = 80p
Total = 60 + 100 + 80 = 240p
= £2.40

Answer £ 2.40 [3]

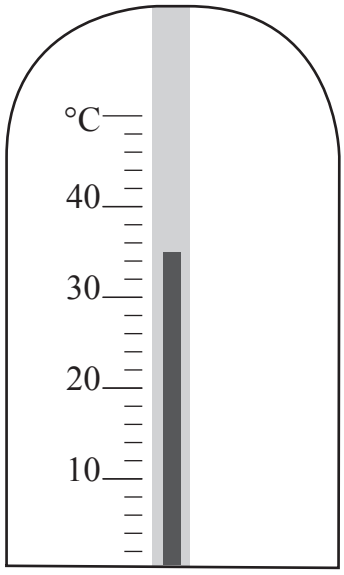
**[Turn over**

**2** **(a)** What speed is shown?




Answer 86 mph [1]

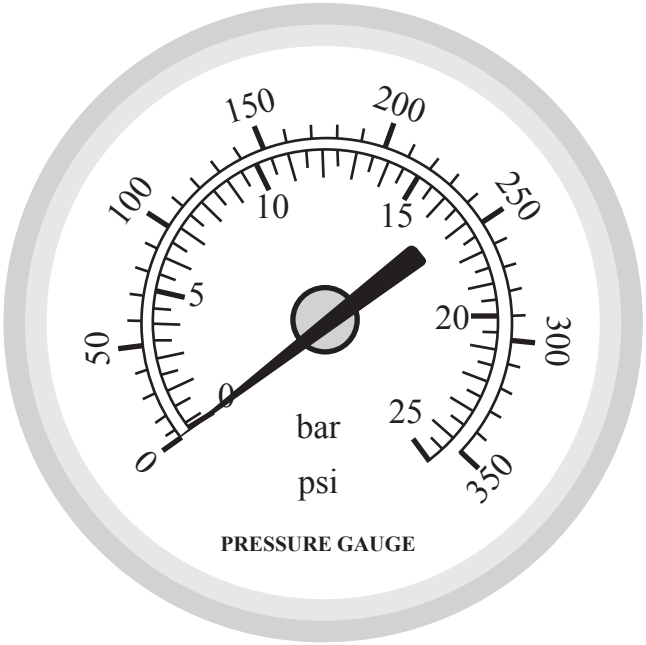
**(b)** What temperature is shown?




Answer 35 °C [1]

**(c)** Pressure can be measured below in psi or bar.

How many psi is 20 bar?



PRESSURE GAUGE

Answer 290 psi [1]

**3** Part of a sequence of coordinates is shown.

(1, 19) (4, 15) (7, 11) (10, 7)

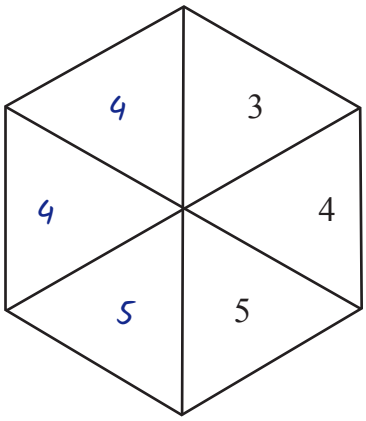
Write down the next term in the sequence.

x: +3 each time, y: −4 each time
10 + 3 = 13, 7 − 4 = 3

Answer ( 13 , 3 ) [2]

**[Turn over**

**4** A spinner with some blank parts is shown.




Write one number in each blank part so that the statements below are true.

The chance of landing on 3 is unlikely.

The chance of landing on 4 is evens.

There is more chance of landing on 5 than on 3 [2]

**BLANK PAGE**

**DO NOT WRITE ON THIS PAGE**

**(Questions continue overleaf)**

**[Turn over**

**5** The distances in miles between some towns are shown.

| | Belfast | Comber | Donaghadee | Newtownards |
|---|---|---|---|---|
| Bangor | 14 | 9 | 7 | 5 |
| Belfast | | 10 | 19 | 13 |
| Comber | | | 12 | 5 |
| Donaghadee | | | | 8 |

**(a)** Anna takes a taxi from Comber to Bangor.

The driver charges 90p per mile plus a £1.50 pick-up fee.

Anna thinks the cost of her fare will be about £10

Work out the cost and then say if you agree with Anna.

**Show your working out.**

*Comber to Bangor = 9 miles*

*9 × 90p = 810p = £8.10*

*£8.10 + £1.50 = £9.60*

Answer *Yes* because *£9.60 is about £10* [4]





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**(b)** Anna buys these items for lunch.

| | |
|---|---|
| Chicken Sandwich | £2.95 |
| Banana | £0.89 |
| Cup of coffee | £1.75 |
| Bottle of water | £1.20 |

She pays with a £10 note.

She gets £2.21 change.

Is this change correct?

**Show your working out.**

2.95 + 0.89 + 1.75 + 1.20 = £6.79

£10.00 − £6.79 = £3.21

She should get £3.21 change

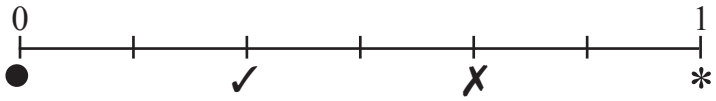
Answer No because her change should be £3.21, not £2.21 [3]

**[Turn over**





**6**




One letter is taken at random from the word COMMON.

Which of ●, ✓, ✗, * shows the probability that the letter is

**(a)** M, Answer ✓ [1]

**(b)** T, Answer ● [1]

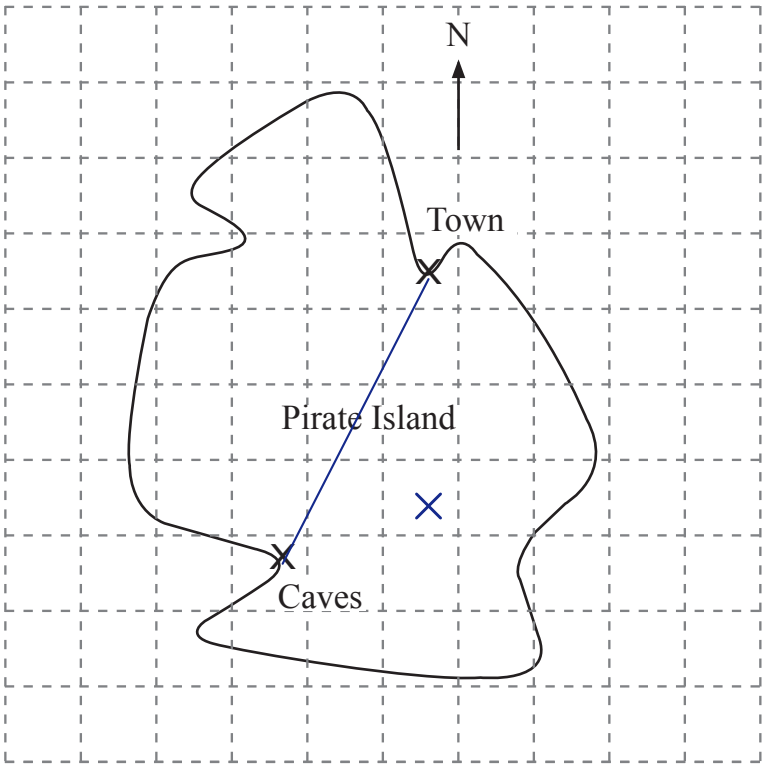
**(c)** a letter that appears twice in COMMON, Answer ✗ [1]

**(d)** a letter in the word MONOCLE? Answer * [1]

COMMON has 6 letters

M: 2/6, T: 0, M or O: 4/6, in MONOCLE: 6/6 = 1

**7**




**SCALE**
**1 cm = 2 km**

**(a)** Use the scale to find the distance from the town to the caves.

4.2 cm × 2 = 8.4 km

Answer 8.4 km [2]

**(b)** Mark, with an X, the position of the buried treasure which is 6 km due South of the town. [1]

**8** **(a)** Fill in the next two terms of this sequence. −1, −2, −3, −4, −5

14, 13, 11, 8, [ 4 ], [ −1 ] [2]

**(b)** Write down the name of the numbers in the sequence below.

1, 8, 27, 64, ...

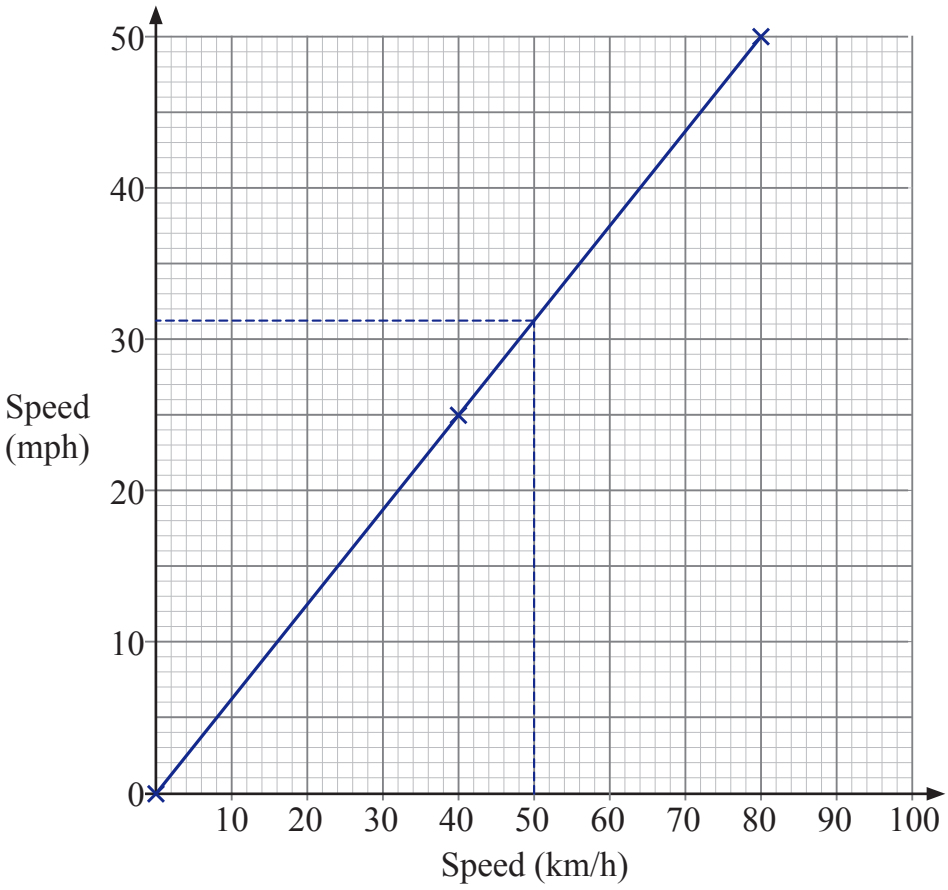
Answer cube numbers [1]

**[Turn over**

**9** Speed can be measured in kilometres per hour (km/h) or miles per hour (mph).

**(a)** Use the values in the table to draw a conversion graph.

| Speed (km/h) | 0 | 40 | 80 |
|---|---|---|---|
| Speed (mph) | 0 | 25 | 50 |




[2]

**(b)** Jonah is travelling at 50 km/h.

Is he breaking the 30 mph speed limit?

You **must use** your graph to help explain your answer clearly.

Answer Yes because my graph shows 50 km/h = 31 mph,

which is more than the 30 mph limit [1]

**10** Tom bought a full bag of coal.

After one week the bag was $\frac{2}{3}$ full.

During the next week he used $\frac{1}{4}$ of the remaining coal.

What fraction was left in the bag?

Used: $\frac{1}{4}$ of $\frac{2}{3} = \frac{1}{4} \times \frac{2}{3} = \frac{2}{12} = \frac{1}{6}$

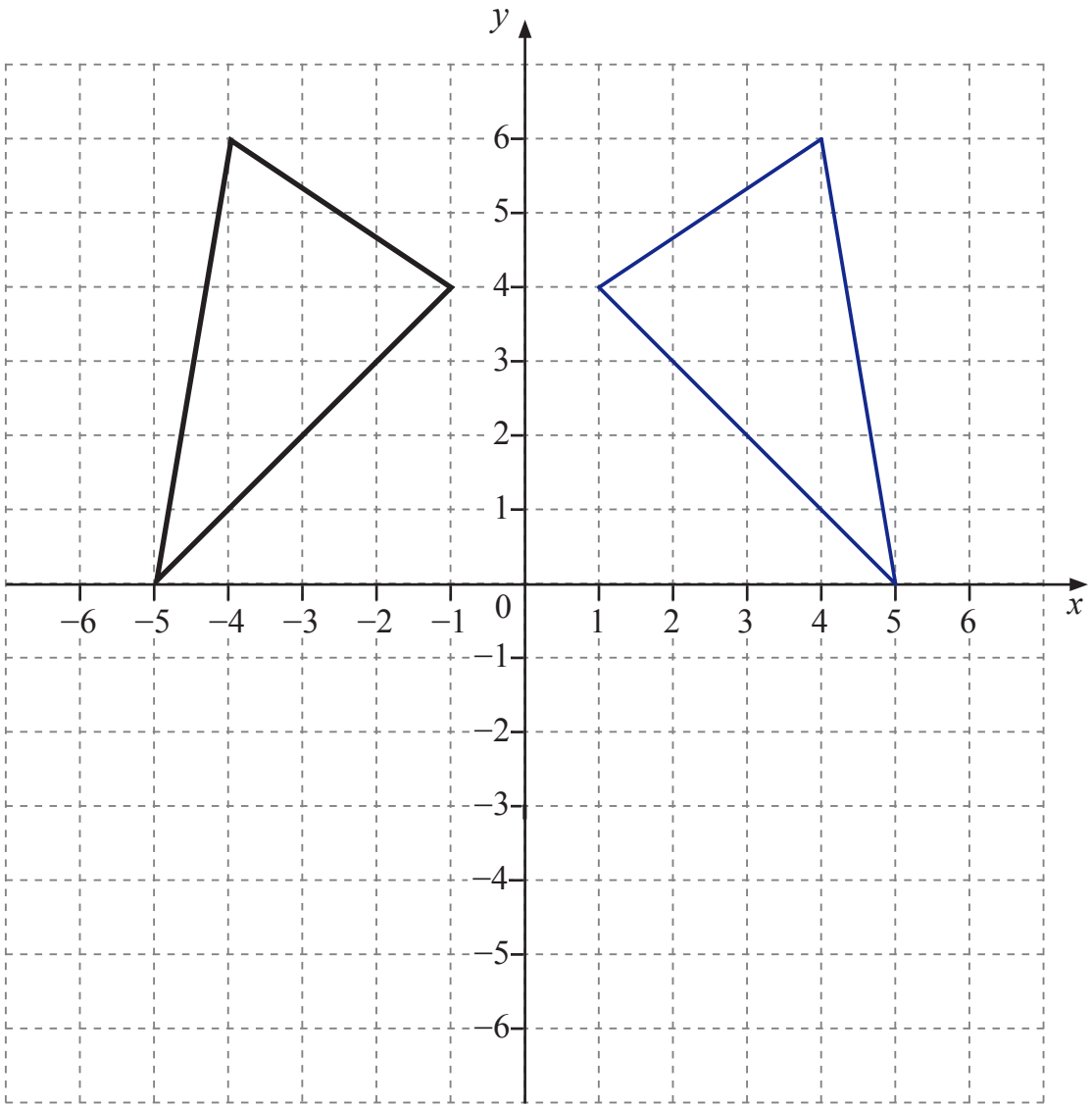
Left: $\frac{2}{3} - \frac{1}{6} = \frac{4}{6} - \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$

(or $\frac{3}{4} \times \frac{2}{3} = \frac{6}{12} = \frac{1}{2}$)

Answer $\frac{1}{2}$ [2]

**[Turn over**

**11** Reflect the triangle shown in the ***y*-axis**.




[1]

**12** **(a)** Calculate the size of angle $x$.

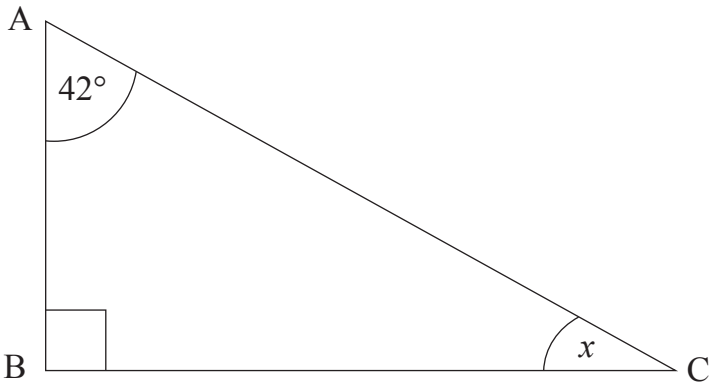


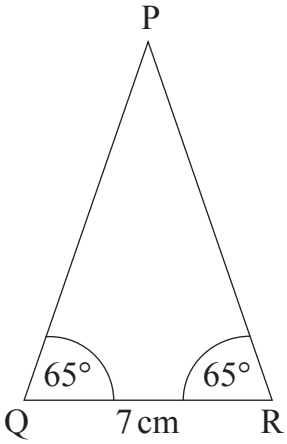

diagram not drawn accurately

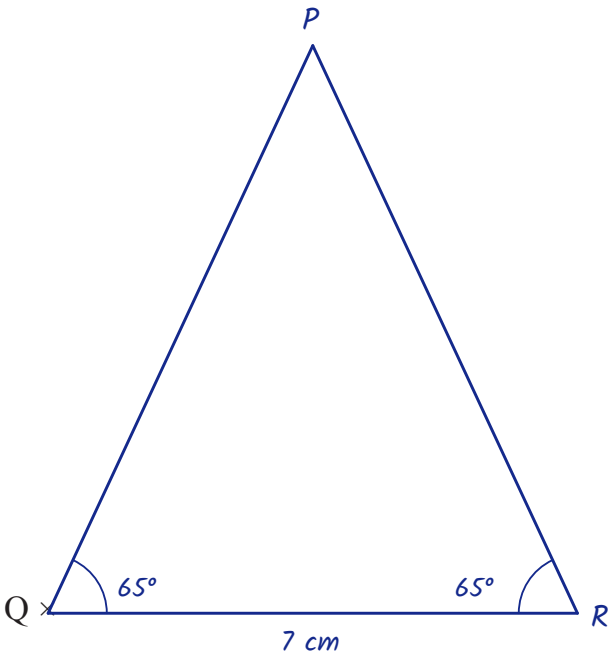
$x = 180 - 90 - 42$

$x = 48$

Answer 48 ° [2]

**(b)** Make an accurate drawing of the triangle sketched below.



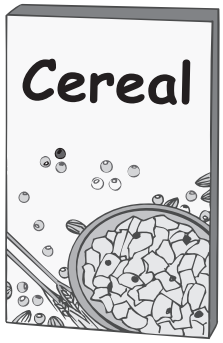

[3]

**[Turn over**

**13** A machine fills boxes of breakfast cereal.

Each box should weigh 375 g.

Jason takes 100 boxes and tests the accuracy of the machine by weighing them.




| Weight (g) | Less than 375 | Exactly 375 | More than 375 |
|---|---|---|---|
| Number of boxes | 9 | 58 | 33 |

**(a)** What is the probability that one of the boxes taken by Jason weighs less than 375 g?

Answer $\frac{9}{100}$ [1]

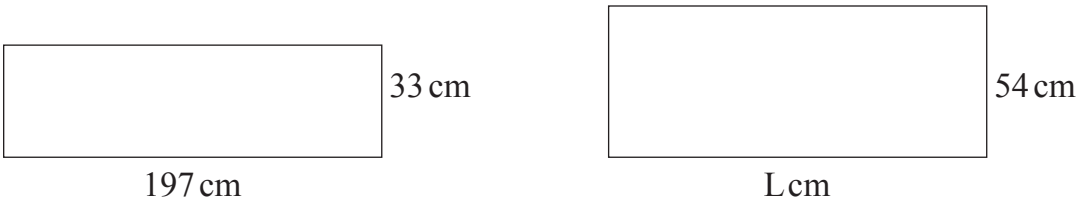
**(b)** The machine fills 5000 boxes.

Calculate the number of boxes you would expect to weigh less than 375 g.

$\frac{9}{100} \times 5000 = 9 \times 50 = 450$

Answer 450 [2]

**14**




The two rectangles above have the same area.

Using estimation, work out an estimate for the length, L, of the second rectangle.

Area ≈ 200 × 30 = 6000 $cm^2$

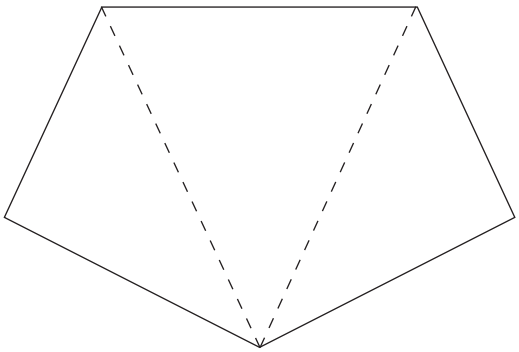
54 ≈ 50

L ≈ 6000 ÷ 50 = 120

Answer L= 120 cm [2]

**[Turn over**

**15**



**(a) (i)** What is the total of all the angles in the three triangles shown?

3 × 180 = 540

Answer 540 ° [1]

**(ii)** What is the sum of the interior angles of a five-sided polygon?

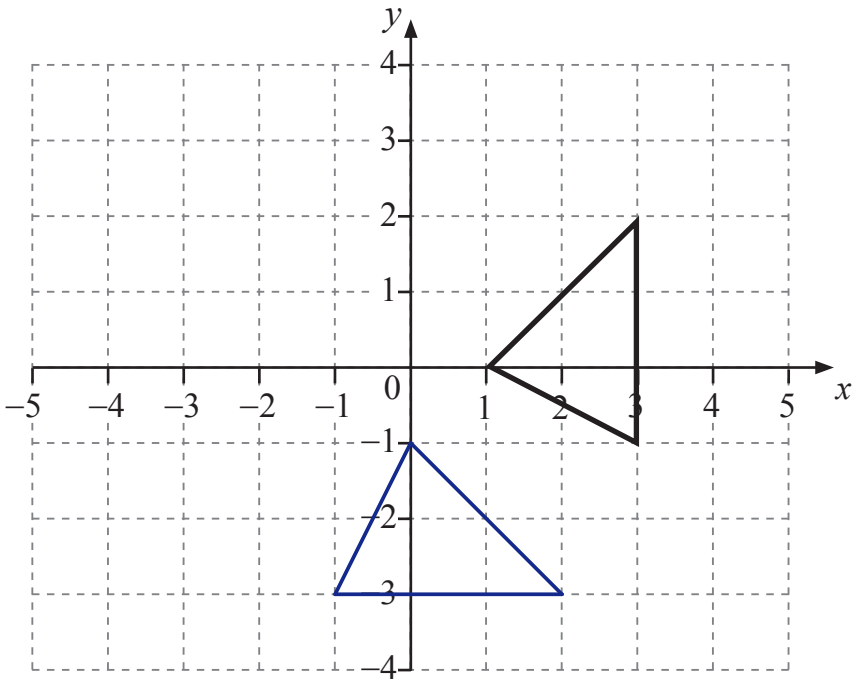
Answer 540 ° [1]

**(b)** What is the sum of the interior angles of a seven-sided polygon?

Answer 900 ° [2]

7 sides → 5 triangles
5 × 180 = 900
(or 540 + 180 + 180 = 900)

**16** Rotate the triangle 90° clockwise about the origin.




[3]

**THIS IS THE END OF THE QUESTION PAPER**




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| For Examiner's use only | |
|---|---|
| **Question Number** | **Marks** |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
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| 6 | |
| 7 | |
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| 9 | |
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| 14 | |
| 15 | |
| 16 | |
| **Total Marks** | |

**Examiner Number**

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