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**F**

# Thursday 19 January 2012 – Afternoon

## GCSE METHODS IN MATHEMATICS

**B391/01** Methods in Mathematics 1 (Foundation Tier)

*B3169301122*

Candidates answer on the Question Paper.

**OCR supplied materials:**
None

**Other materials required:**
- Geometrical instruments
- Tracing paper (optional)

**Duration:** 1 hour

*B391 01*

| Candidate forename | | Candidate surname | |
|---|---|---|---|

| Centre number | | | | | | Candidate number | | | | |
|---|---|---|---|---|---|---|---|---|---|---|

**INSTRUCTIONS TO CANDIDATES**

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Your answers should be supported with appropriate working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

**INFORMATION FOR CANDIDATES**

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- The total number of marks for this paper is **60**.
- This document consists of **16** pages. Any blank pages are indicated.

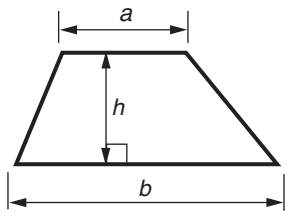
**WARNING**

**No calculator can be used for this paper**

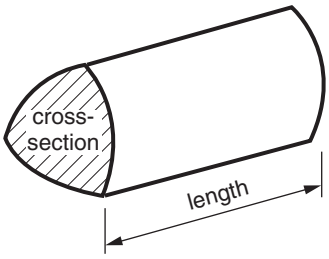
This paper has been pre modified for carrier language

## Formulae Sheet: Foundation Tier

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




**Volume of prism** = (area of cross-section) × length

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**1** Work out.

**(a)** 242 + 173

**(a)** _____ **[1]**

**(b)** 16 × 9

**(b)** _____ **[1]**

**(c)** 26.4 – 8.6

**(c)** _____ **[2]**

**2** **(a)** Write $\frac{12}{20}$ in its simplest form.

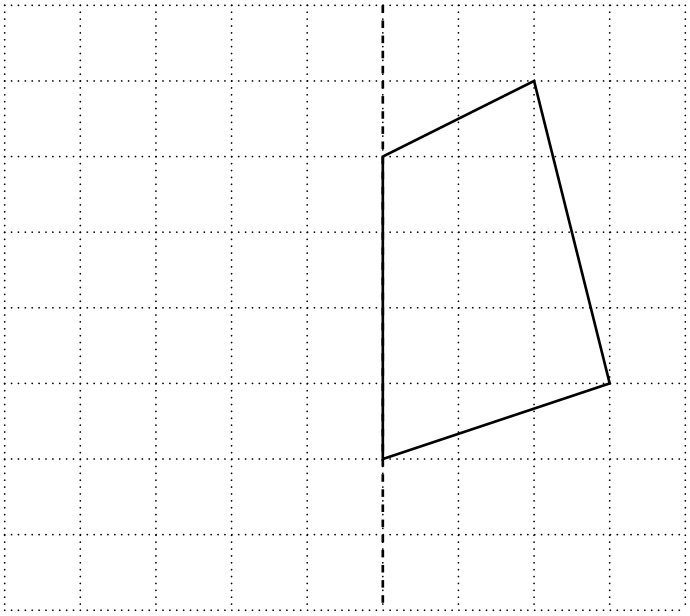
**(a)** _____ **[1]**

**(b)** Write these fractions in order, smallest first.

$\frac{40}{50}$ $\frac{12}{20}$ $\frac{7}{10}$

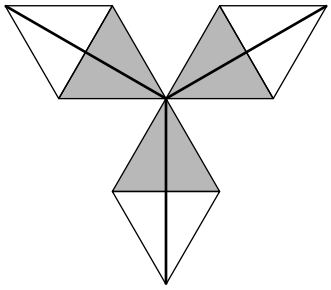
**(b)** _____ , _____ , _____ **[2]**
*smallest*

**3** **(a)** Draw the reflection of the quadrilateral in the mirror line.



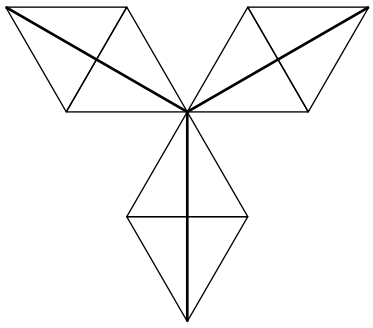

**[2]**

**(b)** Parts of this shape have been shaded so that it has rotational symmetry.

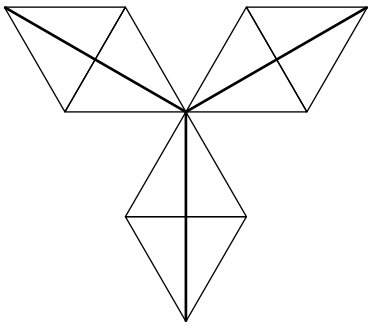


Show two **different** ways to shade parts of the shape so that it still has rotational symmetry.
Do not shade the whole shape.

**(i)**

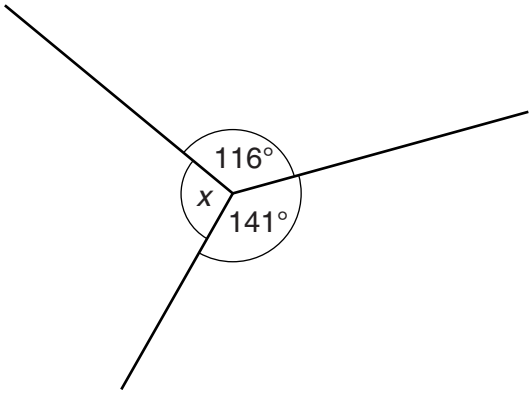


**(ii)**



**[2]**

**4** **(a)** Work out the size of angle *x*.

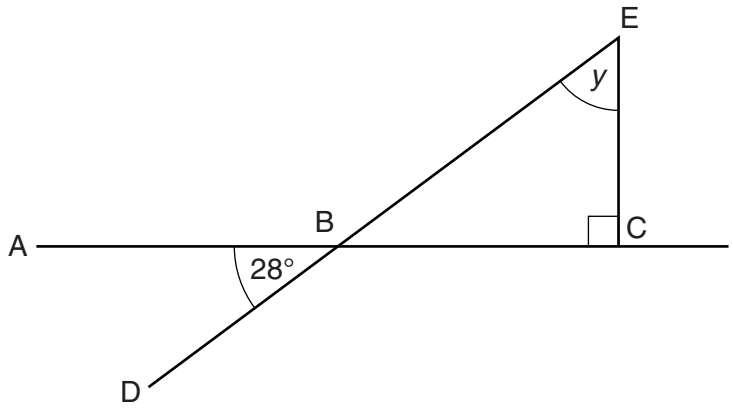



**Not to scale**

**(a)** _____ ° **[2]**

***(b)** In the diagram below, ABC and DBE are straight lines.
Angle ABD = 28°.

Work out the size of angle *y*.
Give a reason for each step of your working.




**Not to scale**

_____

_____

_____

_____

_____

_____ , so *y* is _____ ° **[4]**

**5** **(a)** Calculate.

**(i)** $31.2 \times 10$

**(a)(i)** _____ **[1]**

**(ii)** $31.2 \div 100$

**(ii)** _____ **[1]**

**(b)** Fill in the two spaces below to make the calculation correct.
Use only numbers from this list.

- 10
- 100
- 1000
- 10 000
- 100 000

312 × _____ ÷ _____ = 3.12

**[2]**

**6** **(a)** Write down **all** the factors of 12.

**(a)** _____ **[3]**

**(b)** Which of the two statements below is correct?
Justify your answer.

Statement A: 12 has more factors than multiples.

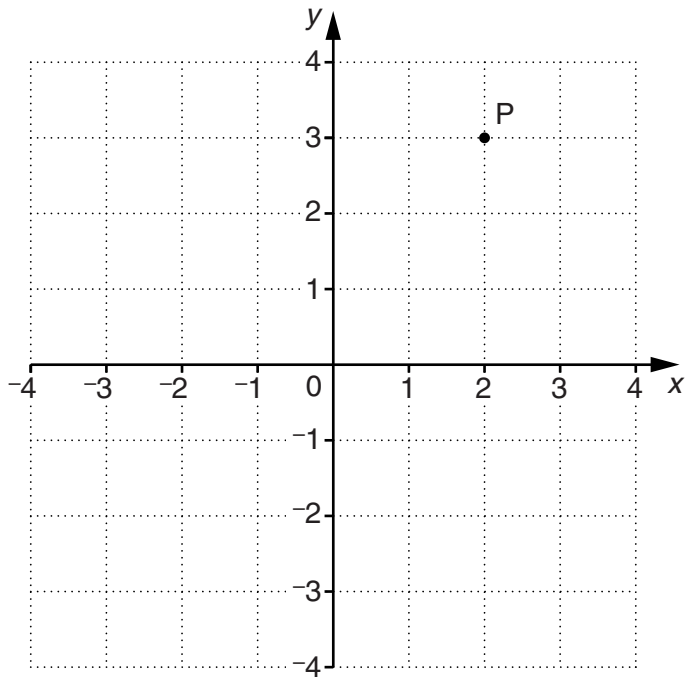
Statement B: 12 has fewer factors than multiples.

Statement _____ is correct because _____

_____

_____ **[2]**

**7**




P is the point (2, 3).

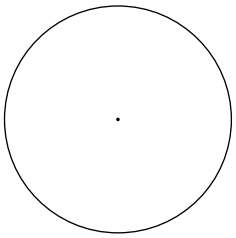
**(a)** Plot the point (2, $^{-}$4) on the grid.
Label this point Q. **[1]**

**(b)** R is a different point which lies on the same line as P and Q.

Give the co-ordinates of a possible position for R.

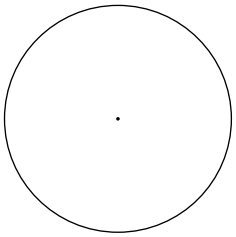
**(b)** ( _____ , _____ ) **[1]**

**8** **(a)** For this circle, draw a radius.



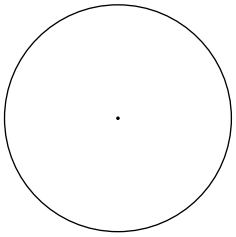
**[1]**

**(b)** For this circle, draw a chord.



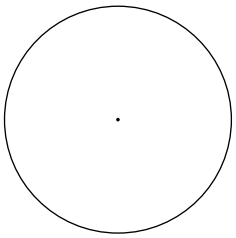
**[1]**

**(c)** For this circle, draw an arc.



**[1]**

**(d)** For this circle, draw and shade a sector.



**[1]**

**(e)** What is the mathematical name for a chord which goes through the centre of a circle?

**(e)** _____ **[1]**

**9** Kadeem is making sums that give different answers.

**(a)** Kadeem makes $(3 + 4) - 5$.

Explain why Kadeem does not need to use the brackets.

_____

_____ **[1]**

**(b)** In his sums, Kadeem uses exactly

- one each of the single-digit numbers 3, 4 and 5
- one subtraction sign
- one addition sign

He can also use brackets when they are needed.

For example, one sum is $3 + 4 - 5 = 2$.

Write down 4 more sums with **different** answers that Kadeem could make.

Sum 1: _____ = _____

Sum 2: _____ = _____

Sum 3: _____ = _____

Sum 4: _____ = _____ **[4]**

**10** **(a)** Courtney does this sum on her calculator.

$$1936 \div 55 = 35.2$$

Using these numbers, suggest a different sum that Courtney could do, on her calculator, to check that her answer is **accurate**.

**(a)** _____ **[1]**

**(b)** Write 3872 correct to

**(i)** the nearest 100,

**(b)(i)** _____ **[1]**

**(ii)** one significant figure.

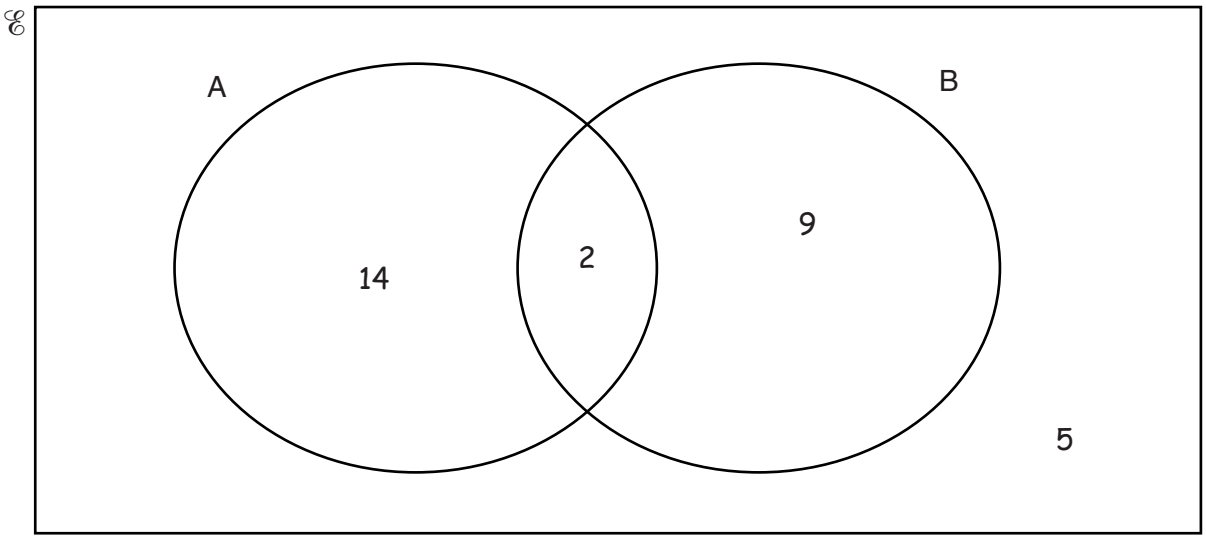
**(ii)** _____ **[1]**

**(c)** **Estimate** the value of $3872 \times 2.13$.

**(c)** _____ **[1]**

**11** A 'lucky dip' box contains toys.
The Venn diagram shows the numbers of each type of toy.

A represents toys that need assembling.
B represents toys that need batteries.




**(a)** How many toys are there altogether?

**(a)** _____ **[1]**

**(b)** Greg picks a toy out of the 'lucky dip' box at random.

Give the probability that it needs

**(i)** batteries **and** assembling,

**(b)(i)** _____ **[1]**

**(ii)** neither batteries nor assembling,

**(ii)** _____ **[1]**

**(iii)** assembling.

**(iii)** _____ **[1]**

**12** Emma is conducting a survey on what the students in her college normally do for lunch.
She selects a random sample of 200 students.
These are her results.

| | Cafeteria | Packed lunch | Go home | Buy at local shop |
|---|---|---|---|---|
| Frequency | 80 | 60 | 24 | 36 |

**(a)** Complete the table of relative frequencies below.
Give your answers as decimals.

| | Cafeteria | Packed lunch | Go home | Buy at local shop |
|---|---|---|---|---|
| Relative Frequency | | | | |

**[2]**

**(b)** Emma says that the relative frequencies in part **(a)** are good estimates of probability.

Is she correct? Give a reason for your answer.

_____ because _____

_____ **[1]**

**(c)** The college has 3200 students.

Estimate the number of students in the college who normally have lunch at the cafeteria.

**(c)** _____ **[2]**

**13** **(a)** Simplify.

$$8x - 4 + 3(2x + 5)$$

**(a)** _____ **[3]**

**(b)** Solve.

$$5x + 3 = 4 - 2x$$

**(b)** _____ **[3]**

**14** The ages of three children add up to 27.
Ben is twice as old as Adam.
Caroline is 7 years older than Adam.

Find the ages of the three children.

Adam _____

Ben _____

Caroline _____ **[3]**

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