

Write your name here

Surname

Other names

**Pearson**  
**Edexcel GCSE**

Centre Number

--	--	--	--	--

Candidate Number

--	--	--	--

# Methods in Mathematics

## Unit 1: Methods 1

*For Approved Pilot Centres ONLY*

**Higher Tier**

Tuesday 17 June 2014 – Morning

**Time: 1 hour 45 minutes**

Paper Reference

**5MM1H/01**

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks



### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators must not be used.**

### Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (\*) are ones where the quality of your written communication will be assessed.

### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

P43402A

©2014 Pearson Education Ltd.

5/5/6/



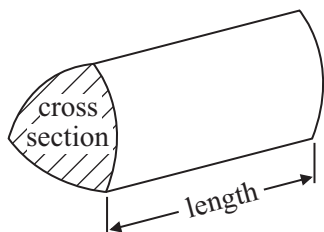
**PEARSON**

# GCSE Mathematics 2MM01

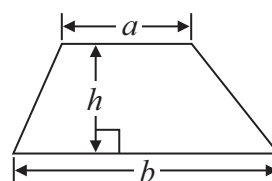
Formulae: Higher Tier

**You must not write on this formulae page.  
Anything you write on this formulae page will gain NO credit.**

**Volume of prism** = area of cross section  $\times$  length

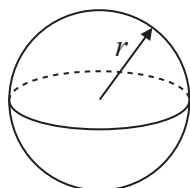


**Area of trapezium** =  $\frac{1}{2} (a + b)h$



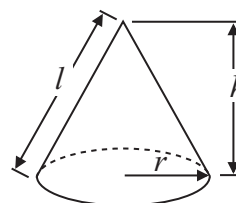
**Volume of sphere** =  $\frac{4}{3} \pi r^3$

**Surface area of sphere** =  $4\pi r^2$

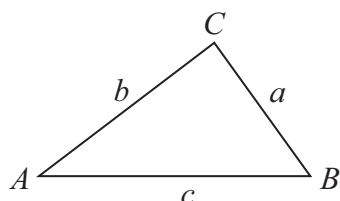


**Volume of cone** =  $\frac{1}{3} \pi r^2 h$

**Curved surface area of cone** =  $\pi r l$



**In any triangle ABC**



**The Quadratic Equation**

The solutions of  $ax^2 + bx + c = 0$   
where  $a \neq 0$ , are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**Sine Rule**  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

**Cosine Rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

**Area of triangle** =  $\frac{1}{2} ab \sin C$



**Answer ALL questions.**

**Write your answers in the spaces provided.**

**You must write down all stages in your working.**

**You must NOT use a calculator.**

**1** Given that  $563 \times 48 = 27\,024$

find the value of

(a)  $5630 \times 48$

.....  
(1)

(b)  $5.63 \times 0.048$

.....  
(1)

(c)  $270.24 \div 24$

.....  
(2)

---

**(Total for Question 1 is 4 marks)**

---



- 2 There are 11 counters in a bag.  
6 of these counters are green.  
5 of these counters are red.

Some more red counters are put into the bag.

A counter is then taken at random from the bag.

The probability that the counter is red is  $\frac{3}{5}$

How many red counters were put into the bag?

.....  
**(Total for Question 2 is 3 marks)**

- 3 Work out an estimate for the value of  $\frac{298 \times 41}{19}$

.....  
**(Total for Question 3 is 2 marks)**



\*4 Here is a shape.

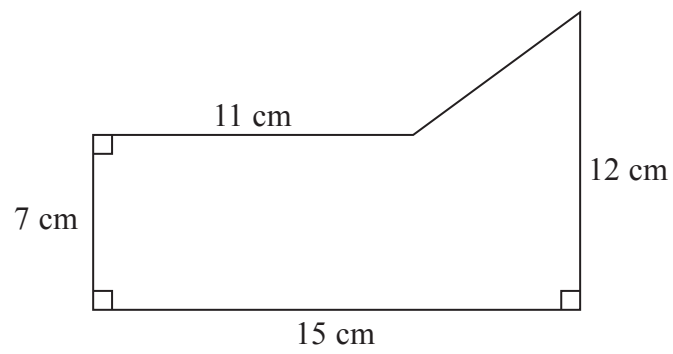


Diagram **NOT**  
accurately drawn

Work out the area of this shape.

(Total for Question 4 is 4 marks)



5 Graham has a 4-sided spinner.

The sides of the spinner are labelled 1, 2, 3 and 4

The table shows each of the probabilities that the spinner will land on 1, on 3 and on 4

<b>Number</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>Probability</b>	0.3		0.15	0.2

Graham spins the spinner once.

(a) Work out the probability that the spinner will land on 2

.....  
(2)

Graham then spins the spinner 60 times.

(b) Work out an estimate for the number of times the spinner will land on 4

.....  
(2)

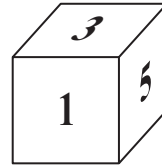
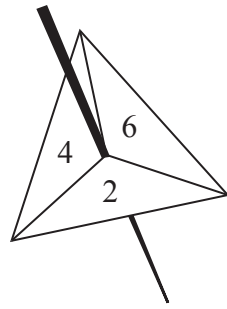
**(Total for Question 5 is 4 marks)**

6 Work out  $63.2 \times 54$

.....  
**(Total for Question 6 is 3 marks)**



- 7 Sue has a fair 3-sided spinner numbered 2, 4 and 6  
She also has a fair 6-sided dice numbered 1, 2, 3, 4, 5 and 6



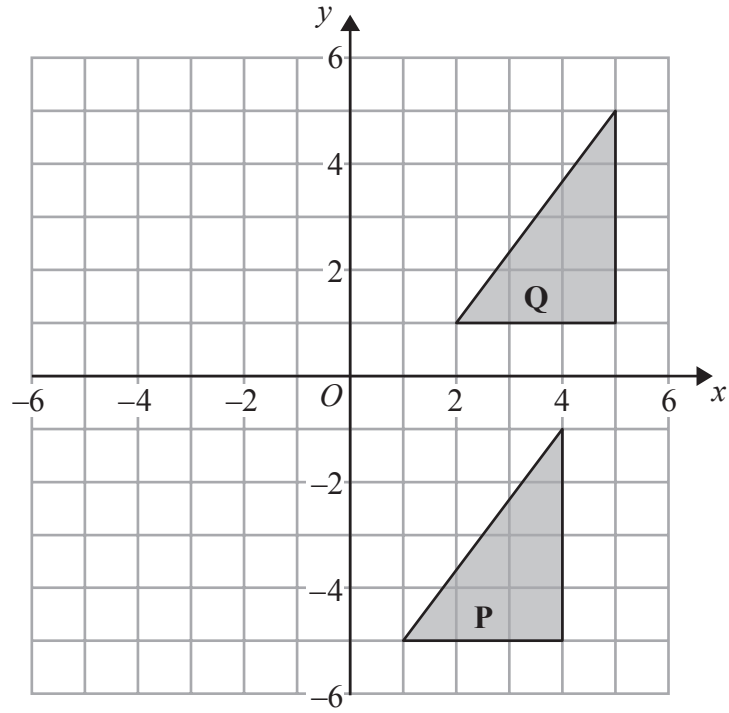
Sue spins the spinner once and rolls the dice once.  
She adds the two numbers together to get the total score.

- (i) Work out the probability that the total score will be 7

- (ii) Work out the probability that the total score will be less than 6

(Total for Question 7 is 5 marks)



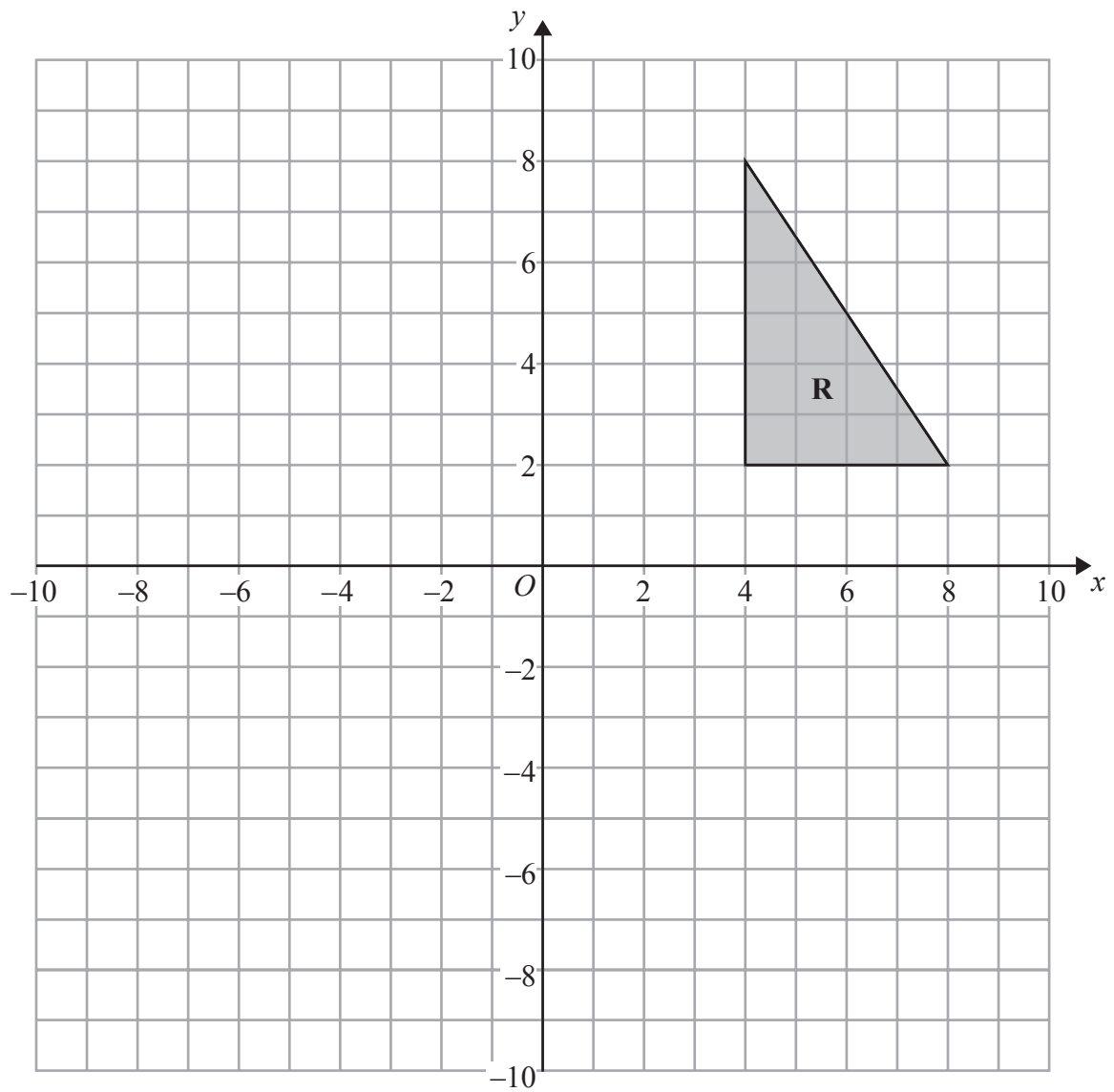


(a) Describe fully the single transformation that maps shape **P** onto shape **Q**.

(2)







(b) Enlarge triangle **R** by scale factor  $-\frac{1}{2}$ , centre (0, 0).

(3)

(Total for Question 8 is 5 marks)



9 (a) Simplify  $\frac{e^7 \times e^8}{e^2}$

.....  
(2)

(b) Simplify  $(g^4)^{-5}$

.....  
(1)

**(Total for Question 9 is 3 marks)**

---



10 Here is a rectangle.

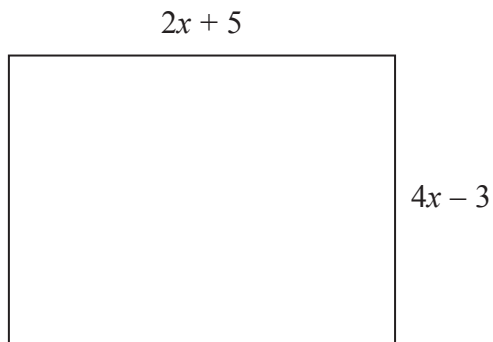


Diagram **NOT** accurately drawn

All the measurements are in centimetres.

The perimeter of the rectangle is 46 cm.

Work out the area of the rectangle.

You must show all your working.

..... cm<sup>2</sup>

(Total for Question 10 is 5 marks)



**11** Express 168 as a product of its prime factors.

.....  
**(Total for Question 11 is 3 marks)**

---



**12** Here is some information about the students in Year 10

There are 60 students in Year 10

34 of the students study French.

25 of the students study German.

18 of the students study both French and German.

(a) Draw a suitable diagram for this information.

(4)

A teacher chooses at random one of the 60 students.

(b) Work out the probability that this student does **not** study French or German.

(2)

(Total for Question 12 is 6 marks)



13 (a) Expand  $h(h - 3)$

.....  
(1)

(b) Factorise fully  $6x^2y^2 + 9xy^3$

.....  
(2)

(c) Expand and simplify  $(m + 8)(m + 5)$

.....  
(2)

**(Total for Question 13 is 5 marks)**

---

14 (a) Find the value of  $64^{\frac{1}{2}}$

.....  
(1)

(b) Find the value of  $3^{-2}$

.....  
(1)

(c) Write down the value of  $8^0$

.....  
(1)

**(Total for Question 14 is 3 marks)**

---



15 (a) Work out  $\frac{1}{3} + \frac{2}{5}$

.....  
(2)

(b) Work out  $2\frac{3}{4} \times 1\frac{3}{5}$

Give your answer in its simplest form.

.....  
(3)

**(Total for Question 15 is 5 marks)**

---



16 (a) Solve  $6x + 5 = 2x + 3$

.....  
(2)

(b) Solve  $\frac{3y - 5}{4} = 2y + 1$

.....  
(3)

(c) Solve  $p^2 - 6p - 55 = 0$

.....  
(3)

---

(Total for Question 16 is 8 marks)





17 (a) Write 806 000 in standard form.

.....  
(1)

(b) Write  $4 \times 10^{-3}$  as an ordinary number.

.....  
(1)

(c) Work out  $(6 \times 10^9) \times (2 \times 10^{-4})$   
Give your answer in standard form.

.....  
(2)

**(Total for Question 17 is 4 marks)**

---



18

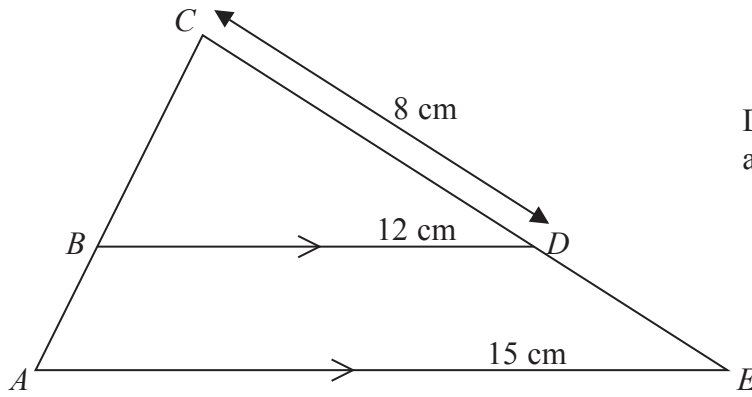


Diagram **NOT** accurately drawn

$ACE$  is a triangle.

$B$  is a point on  $CA$  and  $D$  is a point on  $CE$ .

$BD$  is parallel to  $AE$ .

$CD = 8$  cm.

$BD = 12$  cm.

$AE = 15$  cm.

Work out the length of  $CE$ .

..... cm

(Total for Question 18 is 2 marks)



**19** A and B are two arithmetic sequences.

The first four terms of sequence A are  $-8, -5, -2, 1$

The  $n$ th term of sequence B is  $109 - 2n$

The  $r$ th term of sequence A has the same value as the  $r$ th term of sequence B.

Work out the value of  $r$ .

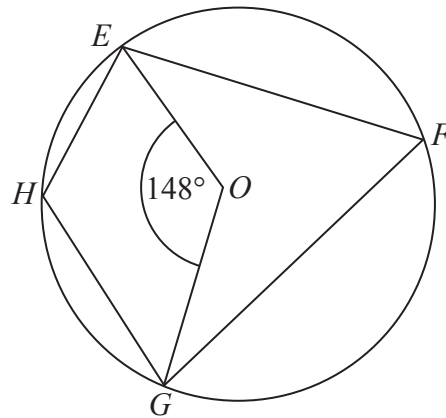
.....  
**(Total for Question 19 is 4 marks)**

---



\*20

Diagram **NOT**  
accurately drawn



$E$ ,  $F$ ,  $G$  and  $H$  are points on the circumference of a circle, centre  $O$ .

Angle  $EOG = 148^\circ$

Work out the size of angle  $EHG$ .

Give a reason for each stage in your working.

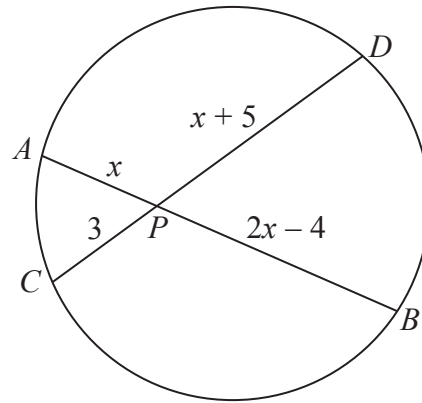
---

(Total for Question 20 is 4 marks)



21

Diagram **NOT**  
accurately drawn



All measurements are in centimetres.  
 $APB$  and  $CPD$  are chords of the circle.

Work out the value of  $x$ .

.....  
(Total for Question 21 is 5 marks)



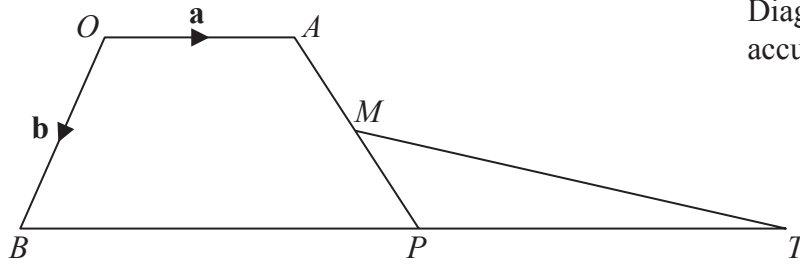


Diagram **NOT**  
accurately drawn

$OAPB$  is a trapezium.

$BPT$  is a straight line with  $BP = PT$ .

$M$  is the midpoint of  $AP$ .

$$\vec{OA} = \mathbf{a}$$

$$\vec{BP} = 2\mathbf{a}$$

$$\vec{OB} = \mathbf{b}$$

Find, in terms of  $\mathbf{a}$  and  $\mathbf{b}$ , the vector  $\vec{MT}$ .

Give your vector in its simplest form.

(Total for Question 22 is 3 marks)



23 Write  $\frac{3}{x-5} - \frac{2}{x+1}$

as a single fraction in its simplest form.

.....  
**(Total for Question 23 is 3 marks)**

---



P 4 3 4 0 2 A 0 2 3 2 8

**24** There are 9 counters in a box.

4 of the counters are red.

2 of the counters are blue.

3 of the counters are yellow.

Pavinder takes at random two counters from the box.

Work out the probability that he takes at least one yellow counter.

.....  
**(Total for Question 24 is 4 marks)**

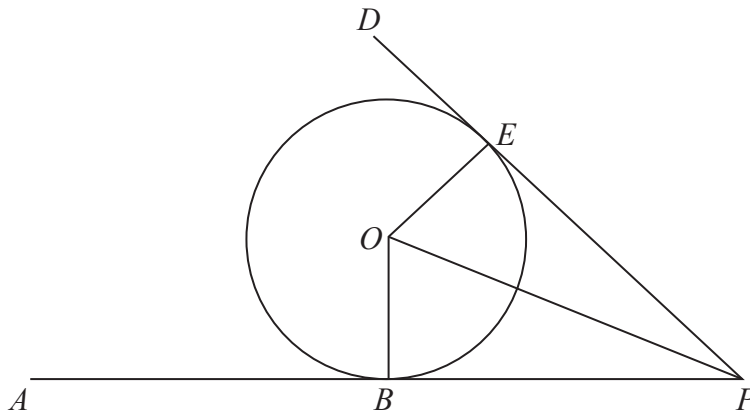
---





\*25

Diagram **NOT**  
accurately drawn



$B$  and  $E$  are points on the circumference of a circle, centre  $O$ .  
 $ABP$  and  $DEP$  are tangents to the circle.

Prove that triangle  $BOP$  and triangle  $EOP$  are congruent.

---

(Total for Question 25 is 3 marks)

---

**TOTAL FOR PAPER IS 100 MARKS**



**BLANK PAGE**



**BLANK PAGE**



**BLANK PAGE**

