



City of London School
3rd Form Mathematics Exam
3rd June 2008
1.45 – 2.45 pm

Paper 2

Name:

Form:

Maths Teacher (circle the appropriate teacher)

ALC DRE JAR JFA SSF
DJC CAH CSS RPH

- Time allowed: 60 mins
- **Calculators are allowed.**
- You will need a ruler and a protractor
- Write your answers in the spaces provided.
- Marks may be obtained for showing clear working.

	%	Grade
Score		
Total	62	
Marker		

1

$$p = 8 \times 10^3$$
$$q = 2 \times 10^4$$

- a Find the value of $p \times q$.
Give your answer in **standard form**.

 2 marks

- b Find the value of $p + q$.
Give your answer in **standard form**.

 2 marks

2 Solve the following equations.


a $\frac{4}{5} = \frac{a}{170}$

 a = 1 mark

b $\frac{4}{5} = \frac{6}{b}$

 b = 1 mark

c $\frac{3}{c+1} + 2 = 0$

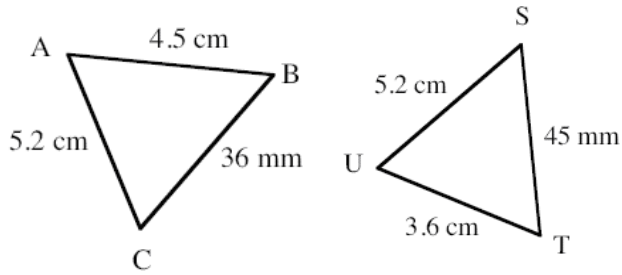
 c = 2 marks

d $\frac{3}{1-2d} = \frac{5}{d+2}$

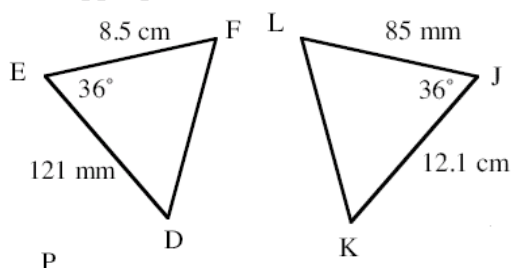
 d = 2 marks

3 Are the pairs of triangles congruent? If so, state the reason for congruency.

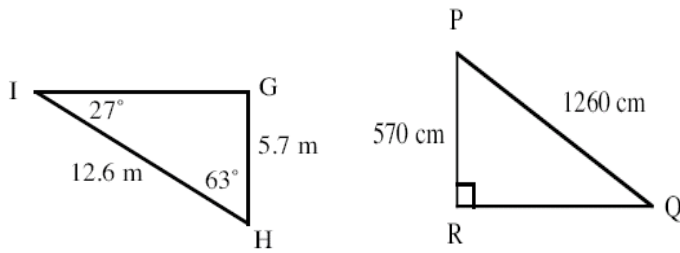
The first pair have been filled in for you as an example



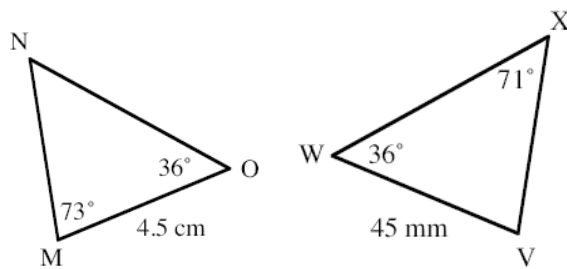
<i>ABC and STU</i>	
Congruent?	Yes
Reason for Congruency	SSS



DEF and JKL	
Congruent?	
Reason for Congruency	



GHI and PQR	
Congruent?	
Reason for Congruency	



MNO and VWX	
Congruent?	
Reason for Congruency	

3 marks

4 Work out

a) 4^0

 1 mark

b) 4^{-2}

 1 mark

c) $4^{\frac{3}{2}}$

 1 mark

5 Ms. Hudson asked fifty pupils in the 3rd form

How much time did you spend on homework last night?

Results

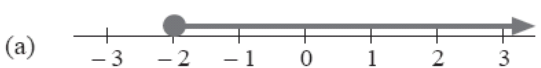
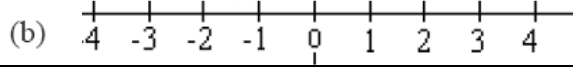
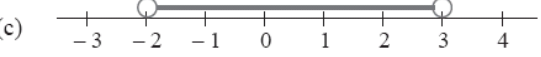
Time spent on homework (minutes)	Frequency
$0 \leq \text{time} < 30$	6
$30 \leq \text{time} < 60$	14
$60 \leq \text{time} < 90$	21
$90 \leq \text{time} < 120$	9
Total	50

Show that an estimate of the **mean** time spent on homework is **64.8 minutes**.



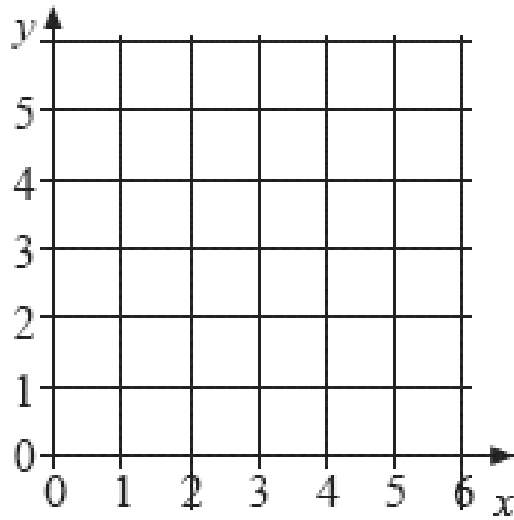
2 marks

6 Write down the inequality represented, or complete the number line

Number Line	Inequality
(a) 	
(b) 	$x < 2$
(c) 	

3 marks

- 7 Shade the region defined by the three rules: $x \leq 4$, $y \geq 2$, $y \leq x$



2 marks

Abbott

- 8 Mr. Ratnasabapathy buys a case of Abbott T-Shirts for £180.
He then sells all the T-shirts for £120.
- a What is his percentage loss?



1 mark

Mr. Chamberlain's Japanese food hut is running a special offer.:

15% Off!
Great Deal! Chilli rice now just £4.25

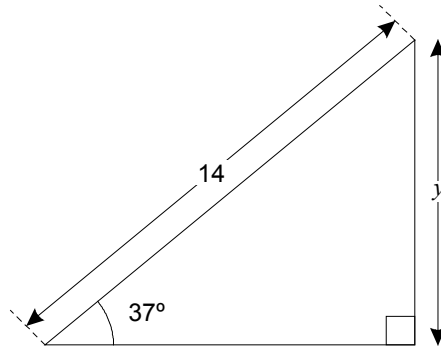
- b What was the original cost of chilli rice? Show your working



2 marks

9 Trigonometry

- a** Calculate the value of y
Show your working.

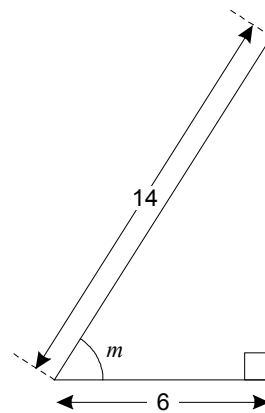


Not drawn accurately

$y = \dots\dots\dots$

2 marks

- b** Calculate the value of angle m
Show your working.



Not drawn accurately

$m = \dots\dots\dots^\circ$

2 marks

10 A regular polygon has 17 sides. Calculate the size of each

- a** external angle (round answer to 1 decimal place)



..... 2 marks

- b** internal angle (round answer to 2 significant figures)



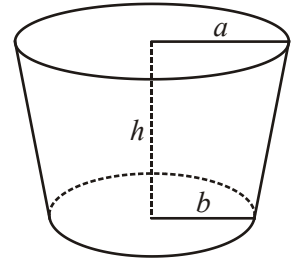
..... 2 marks

A regular polygon has internal angles of 166.6° .

- c** How many sides does it have? Show your working.



..... 2 marks



11 A formula to find the volume, V , of this bowl is

$$V = \frac{1}{3}\pi h \left(\frac{a^3 - b^3}{a - b} \right)$$

a When $a = 10$ cm, $b = 7$ cm and $h = 5$ cm, what is the volume of the bowl?


Give your answer correct to **3 significant figures**.

 cm³

2 marks

b When $b = 0$, the bowl is a cone.

Write a simplified formula for the volume of this cone.

 $V = \dots\dots\dots$

1 mark

12 To celebrate Pythagoras' birthday, Mr. Hubbard buys 379 packets of right-angled crisps, each containing 29 crisps and shares them out among his 211 guests.

a Estimate the mean number of crisps per guest.
Show all your working.

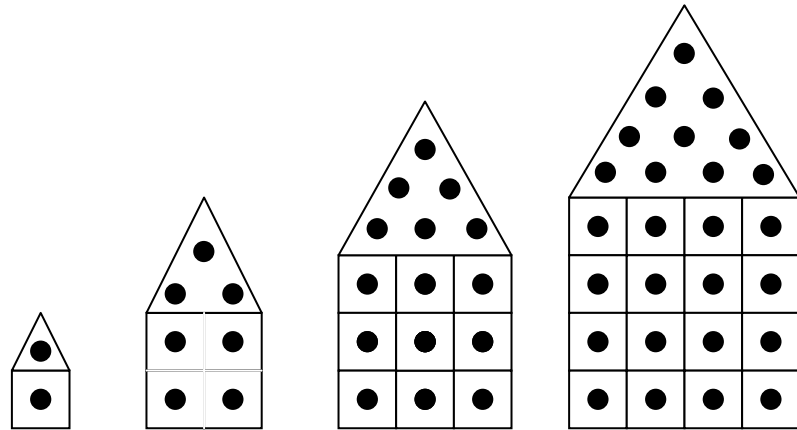
2 marks

Mr. Hubbard buys 80 bottles of lime cordial (to the nearest 10), each containing 750 ml of cordial (to the nearest ml).

b What is the upper bound for the amount of cordial he has bought?

2 marks

13 At the party, Carl and Pascal stack chocolates to look like houses:



House	1	2	3	4
Chocolates	2	7	15	26

a How many chocolates will they need for the 5th house?

 1 mark

b How many chocolates will they need for the nth house?

 3 marks

14 Use trial and improvement to find a solution to $x^2 - 5x + 3 = 0$ Find the answer to 1 d.p

x	$x^2 - 5x + 3$
0	3
1	-1

3 marks

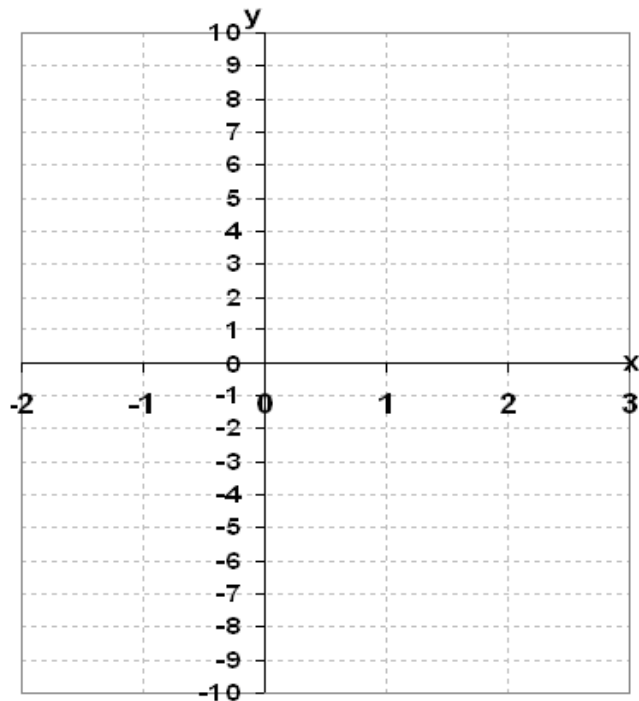
15 The table below shows values of x and y for the equation $y = x^2 + x - 5$.

a Complete the table.

x	-2	-1	0	1	2	3
y				-3	1	7

2 marks

b Plot the graph of $y = x^2 + x - 5$



2 marks

c Use your graph to find a value of x for which $x^2 + x - 5 = 0$



$x = \dots\dots\dots$

1 mark

d Use your graph to find a value of x for which $x^2 + x - 5 = 6x - 8$



$x = \dots\dots\dots$

2 marks

e Explain why part d gives you the same answer as question 14

1 mark

16 Construct as many unique (non-congruent) triangles as you can where

One line is **5cm** long,
another is **4cm** long and
one of the angles is **30°**.

In each case measure the length of the third side and write its value
clearly next to the triangle.

4 marks

END OF TEST