Please circle your maths teacher's initials: PRN, JME, RDA, RSB

KING'S COLLEGE JUNIOR SCHOOL
WIMBLEDON

UPPER REMOVES

MATHEMATICS 2
(Calculator)

JANUARY 2013

Time: 60 minutes

Name: _____

Please read this information before the examination starts

- **All** questions should be attempted.
- A completely correct answer will receive **no** marks unless you show all your working. Give the correct units when necessary.
- Calculators are allowed
- Give your answers to 3 significant figures if necessary and not otherwise specified within the question.
- If you have time at the end, check your answers carefully.

2. Look at this sequence of Fibonacci numbers:

1 2 3 5 8 .... 21 89

(i) Write down the three missing terms.

Answer ..... (2)

(ii) From this list of 10 numbers, and **using them only once**, write down two numbers which are

(a) multiples of 3

Answer: ... ., ... (2)

(b) cube numbers

Answer: ... . (2)

(c) two-digit prime numbers

Answer: .... (2)

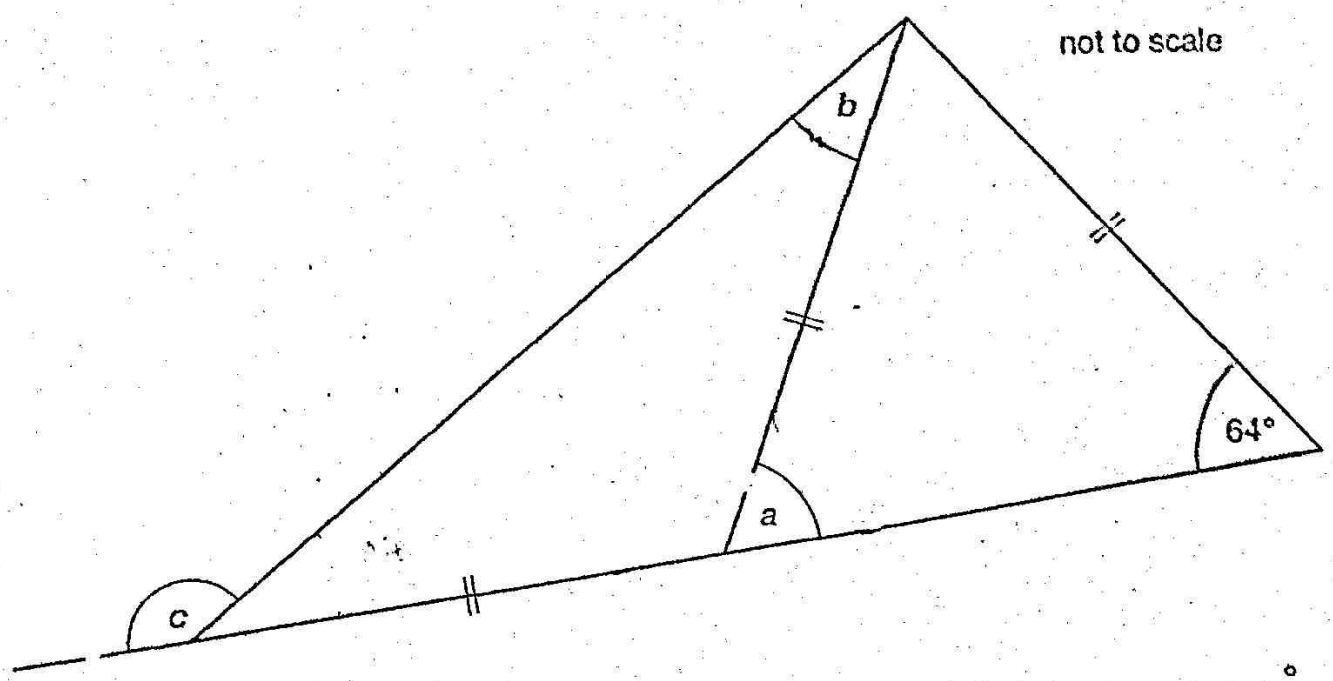
(d) factors of 40

Answer: ....., ... (2)

3. The two digits of 29 are 2 and 9
Write down a multiple of 12 whose two digits add up to 12

Answer: ... . (2)

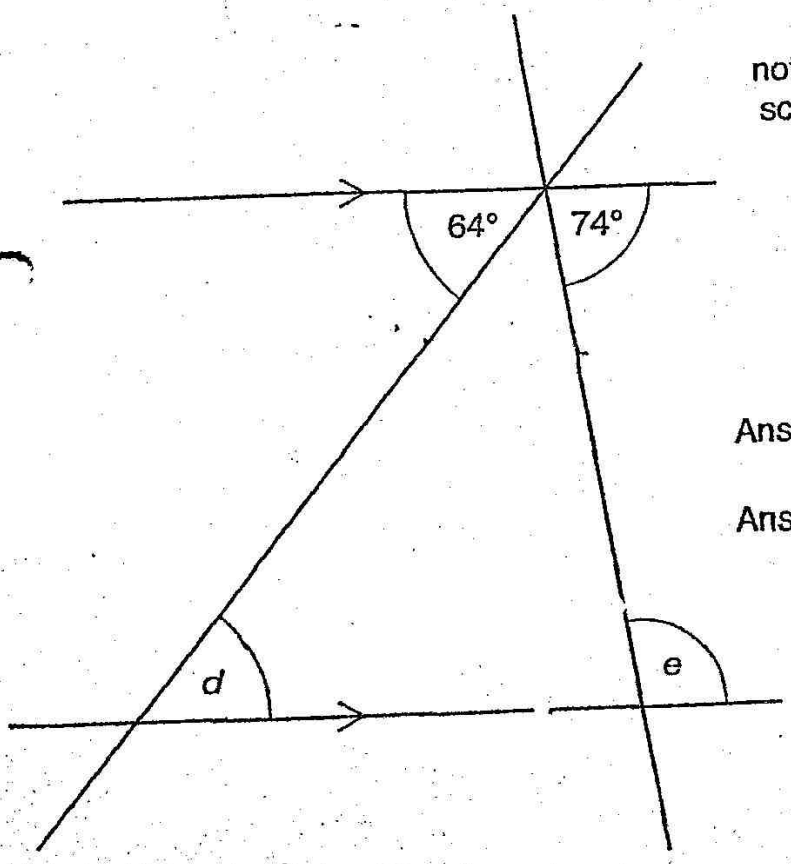
5. Calculate the size of each of the angles marked *a*, *b*, *c*, *d* and *e*.



Answer: $a =$ ..... ° ..... (1)

Answer: $b =$ .... ° (2)

Answer: $c =$ .... (2)



Answer: $d =$ .... ° (1)

Answer: $e =$ ..... (2)

7. (a) 1 inch = 2.54 centimetres.

(i) A piece of string is 64 inches long.

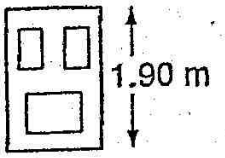
Write this length in centimetres.

Give your answer correct to 1 decimal place.

Answer: .... cm (2)

(ii) A door is 1.90 metres high.

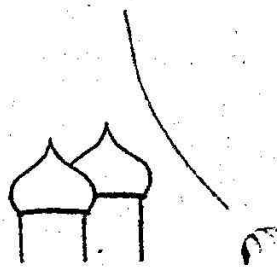
Write this height in inches correct to the nearest inch.



Answer: .... inches (2)

(b) To convert a temperature measured in degrees Fahrenheit (°F) to one measured in degrees Celsius (°C), the following formula is used:

$$C = \frac{5}{9}(F - 32)$$



(i) The temperature in Russia is −4 °F.

Calculate this temperature in degrees Celsius.

Answer: ....°C (1)

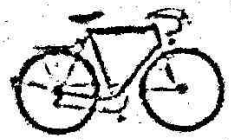
(ii) Theo has a temperature of 40 °C.

Calculate his temperature in degrees Fahrenheit.

Answer: .....°F (3)

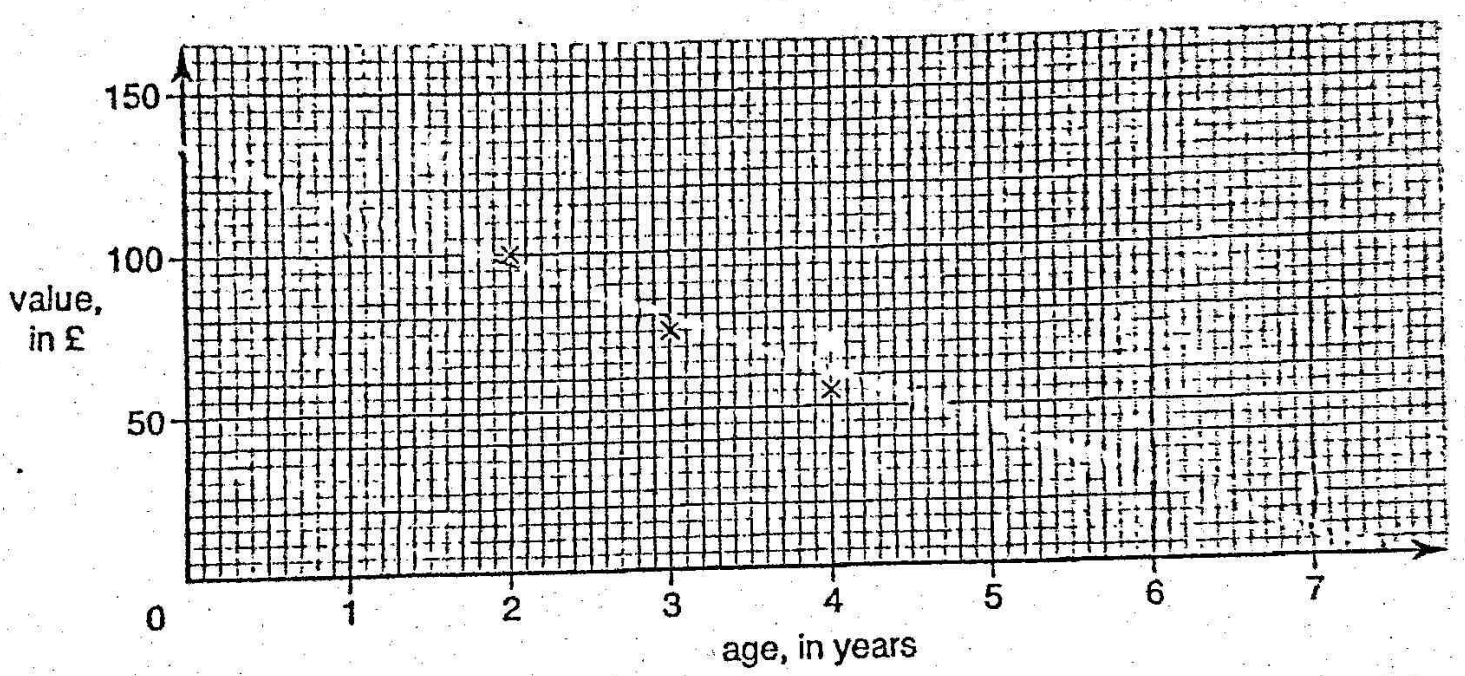
9. Bob sells second-hand bikes.

The age and value of each of seven bikes are shown in the table below.



age of bike, in years	2	3	4	4	1	6	7
value of bike, in £	100	75	55	70	105	30	20

Bob plots the first three results on a scatter graph.



(i) Plot the remaining four results on the scatter graph. (2)

(ii) Draw a line of best fit on the graph. (1)

(iii) Which sort of correlation is shown on this graph?

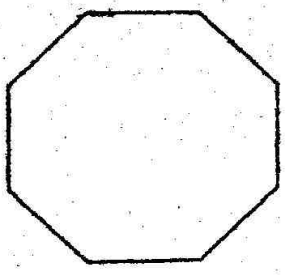
Answer: ..... (1)

A student brings Bob a bike which is 5 years old.

(iv) Use your line to estimate its value, showing clearly where you take your reading.

Answer: £ ..... (2)

1. (i) (a) Calculate the size of an exterior angle of a regular octagon.



not to scale

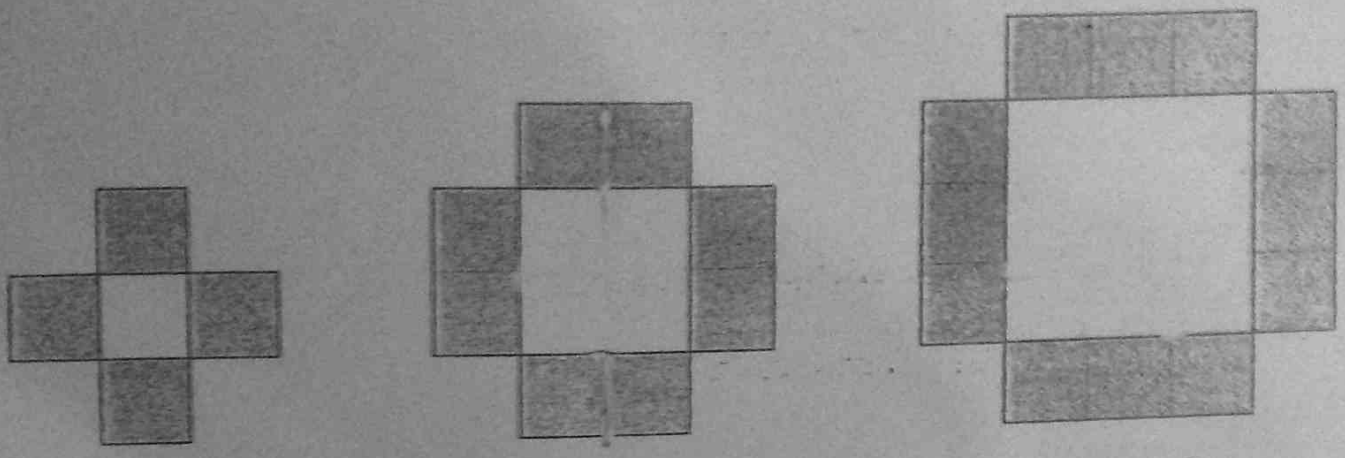
Answer: ..... ° (2)

(b) Calculate the size of an interior angle of a regular octagon.

Answer: ..... ° (1)

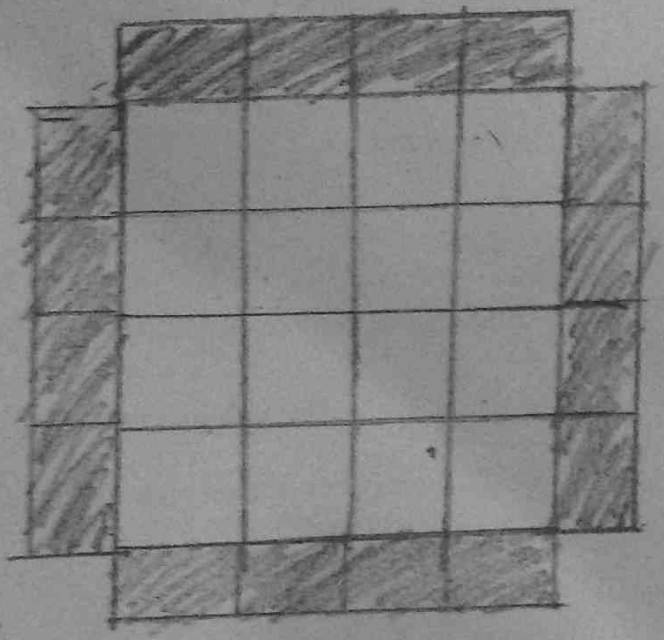
The squares in this question are all 1-centimetre squares.

12. Here are the first three patterns in a sequence made of white and grey squares.



pattern 1 pattern 2 pattern 3

(i) Draw pattern 4 below.



(1)

(ii) Complete the table for patterns 1 to 5

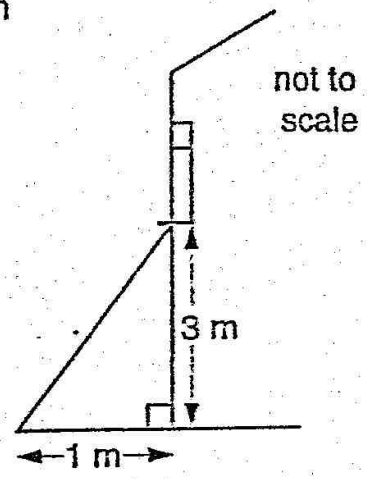
pattern number	1	2	3	4	5
number of white squares	1	4	9		
number of grey squares	4	8	12		
total number of squares	5	12	21		

(2)

13. Felix puts his ladder up against his house.

He places its base 1 metre out from the wall and, when it is its normal length, the ladder just reaches the window ledge, 3 metres above the ground.

(i) Use Pythagoras' Theorem to calculate the normal length of Felix's ladder.



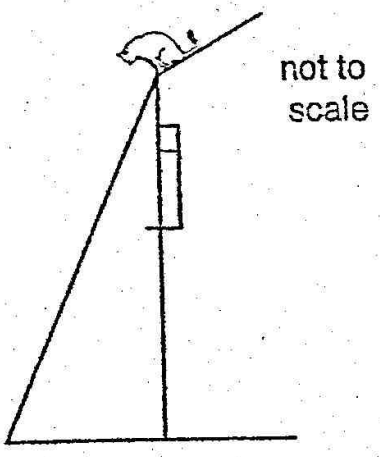
Answer: ..... m (2)

Felix's cat is stuck on the roof.

Felix extends his ladder to twice its normal length and places its base 1.5 m from the wall.

The top of the ladder just reaches his cat.

(ii) At what height is the cat above the window ledge?



Answer: ..... m (4)