

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

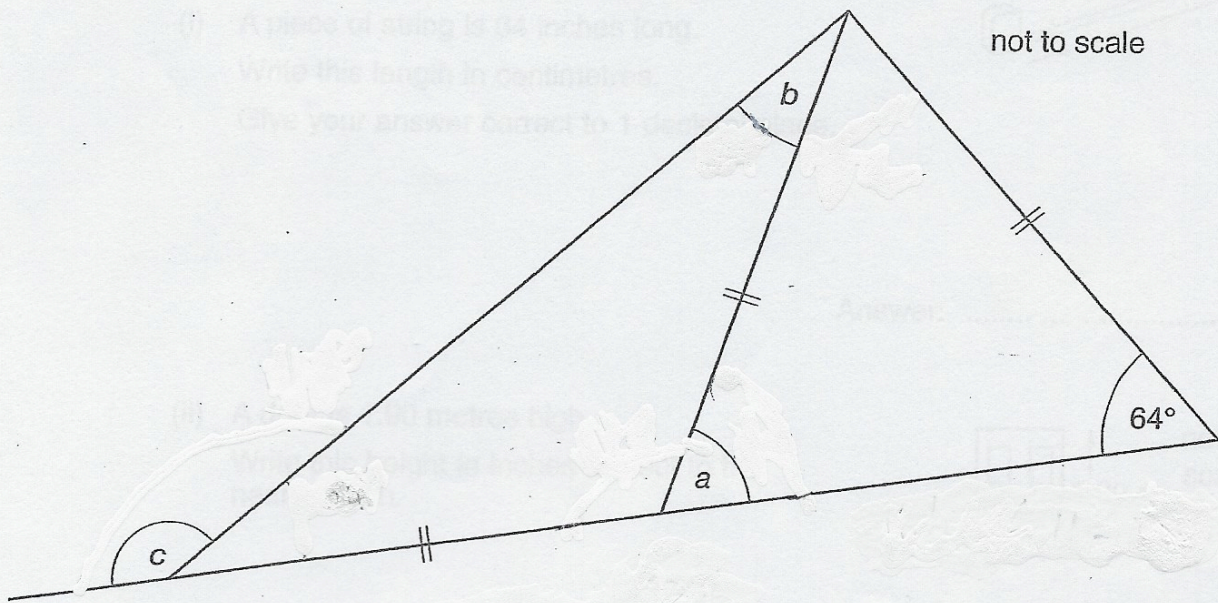
Answer: ..... (2)

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)

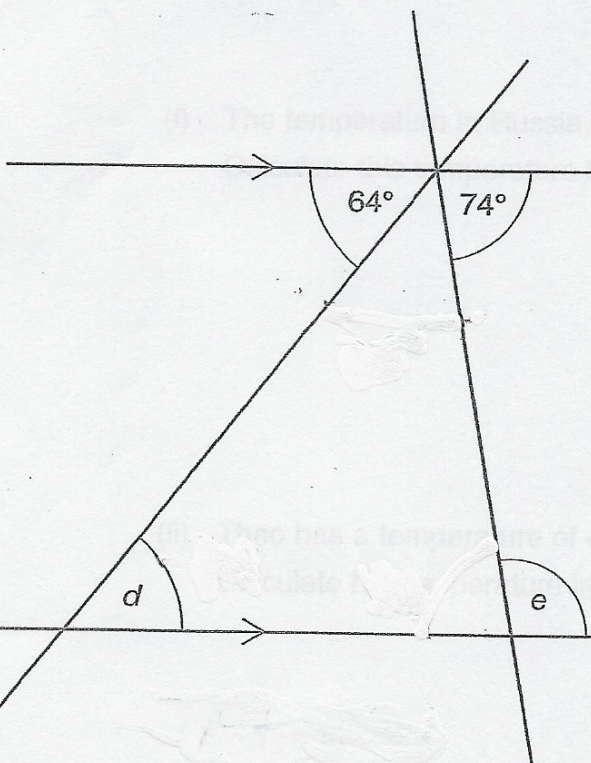
5. Calculate the size of each of the angles marked  $a$ ,  $b$ ,  $c$ ,  $d$  and  $e$ .



Answer:  $a = \dots\dots\dots$  (1)

Answer:  $b = \dots\dots\dots$  (2)

Answer:  $c = \dots\dots\dots$  (2)



Answer:  $d = \dots\dots\dots$  (1)

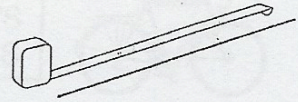
Answer:  $e = \dots\dots\dots$  (2)

7. (a) 1 inch = 2.54 centimetres.

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

Write this length in centimetres.

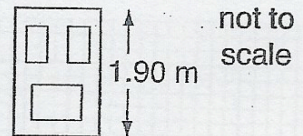
Give your answer correct to 1 decimal place.



Answer: ..... cm (2)

(ii) A door is 1.90 metres high.

Write this height in inches correct to the nearest inch.



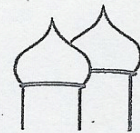
Answer: ..... inches (2)

(b) To convert a temperature measured in degrees Fahrenheit ( $^{\circ}\text{F}$ ) to one measured in degrees Celsius ( $^{\circ}\text{C}$ ), the following formula is used:

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

(i) The temperature in Russia is  $-4^{\circ}\text{F}$ .

Calculate this temperature in degrees Celsius.



Answer: ..... $^{\circ}\text{C}$  (1)

(ii) Theo has a temperature of  $40^{\circ}\text{C}$ .

Calculate his temperature in degrees Fahrenheit.

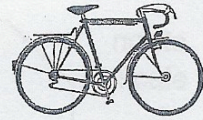


Answer: ..... $^{\circ}\text{F}$  (3)

9. Bob sells second-hand bikes.

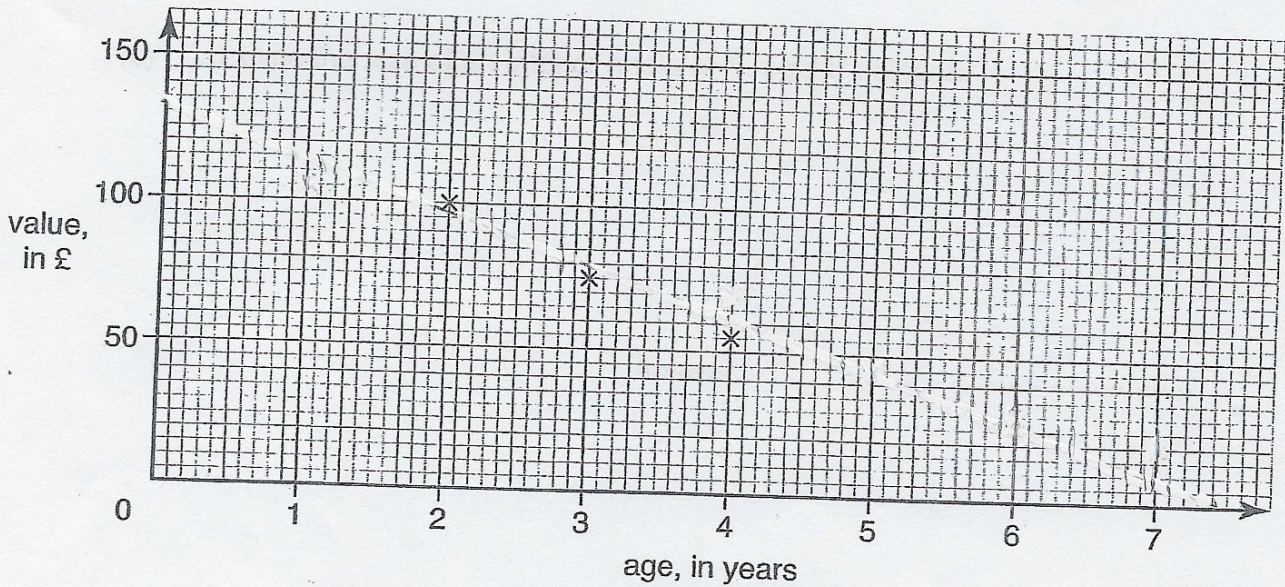
The age and value of each of seven bikes are shown in the table below.

BOB'S  
BIKES



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?

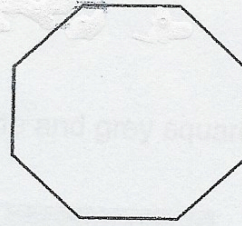
Answer: ..... (1)

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)

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



not to scale

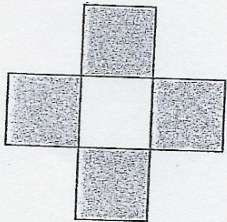
Answer: ..... (2)

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

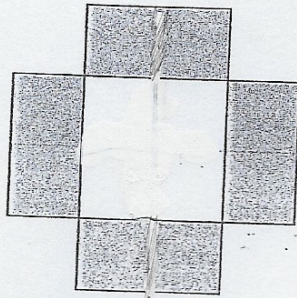
Answer: ..... (1)

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

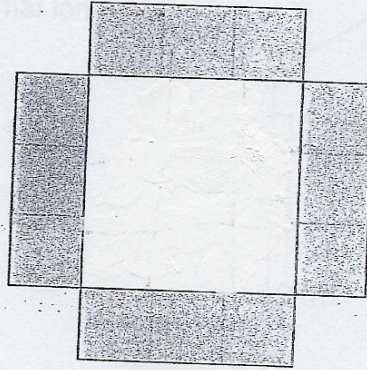
12. Here are the first three patterns in a sequence made of white and grey squares.



pattern 1

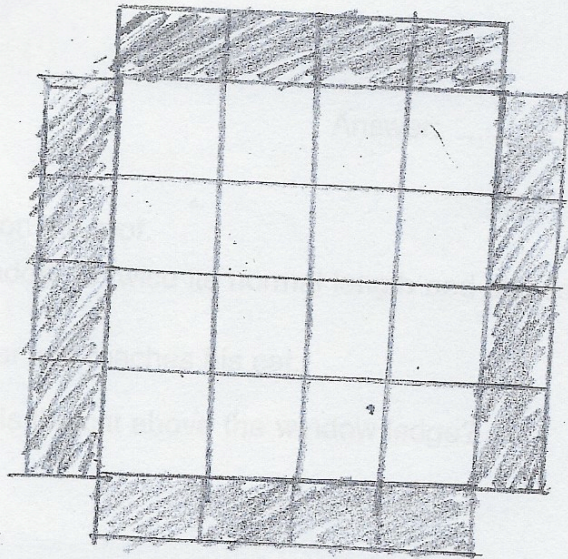


pattern 2



pattern 3

(i) Draw pattern 4 below.



(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		

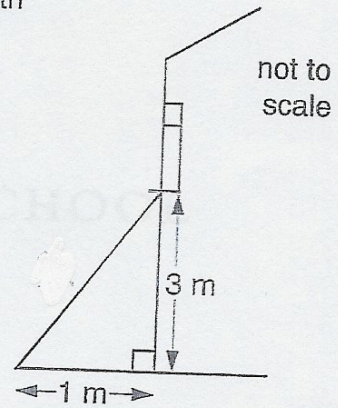
(1)

(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.



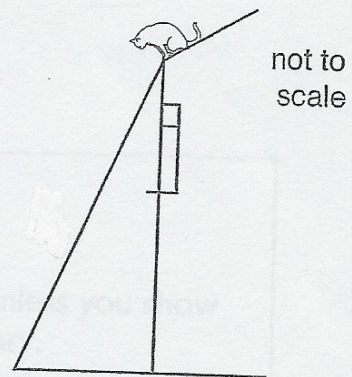
Answer: ..... m (2)

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)

(Total marks: 100)

