SURNAME .... FIRST NAME ....

JUNIOR SCHOOL .... SENIOR SCHOOL ....
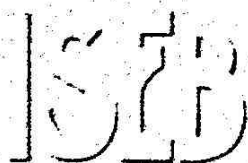
**Independent Schools
Examinations Board**

COMMON ENTRANCE EXAMINATION AT 13+

# MATHEMATICS

PAPER 2: Non-Calculator Paper

Monday 2 June 2008

Please read this information before the examination starts.

- This examination is 60 minutes long.

- All questions should be attempted.

- A row of dots .... denotes a space for your answer.

- A completely correct answer may receive no marks unless you show all your working.

- Answers given as fractions should be reduced to their lowest terms.

1. (a) Roger buys a sandwich which costs £1.89, a packet of biscuits for 67p and a cup of coffee for 85p.

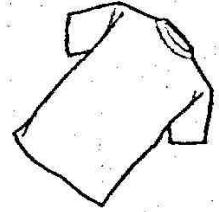How much does Roger spend altogether?
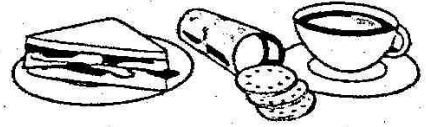
Answer: £ .... (2)

(b) Sunita wants to buy a T-shirt costing £15
So far she has saved £11.55
How much more must she save to be able to buy the T-shirt?

Answer: £ .... (2)

(c) Mr Thomas buys 6 calculators which cost £9.85 each.
How much does he pay altogether?
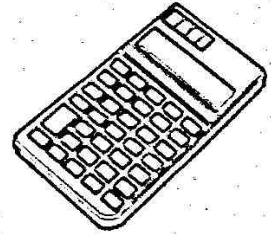
Answer: £ .... (2)

(d) 15 iced buns cost £4.05
What is the cost in pence of one iced bun?
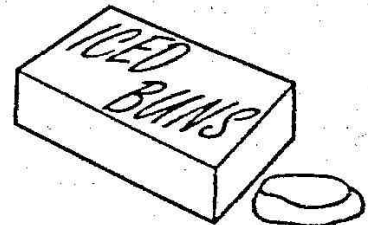
Answer: .... p (2)

2. (a) Write $\frac{3}{8}$ as a decimal.

Answer: .... (2)

(b) Write 0.08 as a fraction in its simplest form.

Answer: .... (2)

(c) Calculate 45% of £5

Answer: £ .... (2)

(d) Write £1.80 as a percentage of £2.50

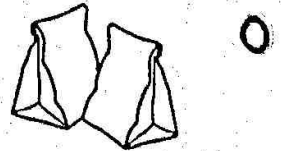Answer: .... % (2)

Turn over

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3. (a) Ann buys a roll of kitchen foil which is 6 metres long.
Each day she uses 40 centimetres of foil to wrap her sandwiches.
For how many days does the roll of foil last?
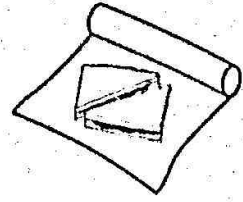
Answer: .... days (2)

(b) A bag contains 125 grams of mint creams.
Sam sells 50 of these bags at a fête.
How many kilograms of mint creams does Sam sell at the fête?

Answer: .... kg (2)

4. (a) Calculate

(i) $18 - 12 + 2 \times 4$

Answer: .... (1)

(ii) $18 - 12 \div 2 + 4$

Answer: .... (2)

(b) Calculate $\sqrt{16} + 2^3$

Answer: .... (2)

(c) (i) Write both 24 and 60 as a product of prime factors.

Answer: 24 = ... and 60 = ... (3)

(ii) Write down the smallest number that can be divided exactly by 24 and 60

Answer: .... (1)

5. Pedro's relish contains masses of red and green chillies in the ratio 4 : 3

(i) There are 72 grams of green chillies in a jar of Pedro's relish.
What is the mass of red chillies in the jar?
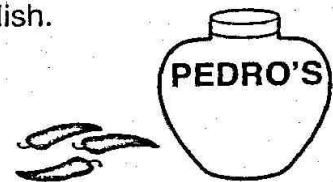
Answer: .... g (2)

(ii) A large tub of Pedro's relish contains 8.4 kilograms of chillies altogether.
What is the mass of the green chillies in the tub?

Answer: .... kg (2)

6. Simplify

(i) $4x^3 + 3x^3 - x^3$

Answer: .... (1)

(ii) $4x^3 \times 3x^4$

Answer: .... (2)

(iii) $(2x^2)^4$

Answer: .... (2)

(iv) $\dfrac{8x^3}{6x^6}$

Answer: .... (2)

7. (a) Given that $p = 6$ and $q = {}^-3$ find the value of

(i) $\dfrac{3p - 2q}{6}$

Answer: .... (2)

(ii) $\frac{1}{3}pq$

Answer: .... (1)

(iii) $2p - q^2$

Answer: .... (2)

(iv) $\dfrac{p + q}{q - p}$

Answer: .... (2)

(b) If $n = \sqrt{\dfrac{A}{9}}$ find the value of n when $A = 576$

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

8. (a) A group of 5 friends eats 4 tortillas between them.

Pablo eats $1\frac{1}{4}$ tortillas and Elena eats $\frac{7}{8}$ of a tortilla.
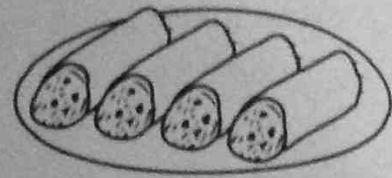
(i) How many tortillas do Pablo and Elena eat altogether?

Answer: .... (2)

(ii) How many tortillas remain uneaten?

Answer: .... (1)

The 3 other friends share equally what remains of the tortillas.

(iii) What fraction of a tortilla does each of these friends eat?

Answer: .... (2)

(b) A large bath is filled with water.
The bath has a leak, so the water level drops by $\frac{3}{4}$ of an inch each day.
How long will it take for the water level to drop 6 inches?

Answer: .... days (2)

(c) Nellie, the elephant, eats $\frac{4}{5}$ of a tonne of hay each day.
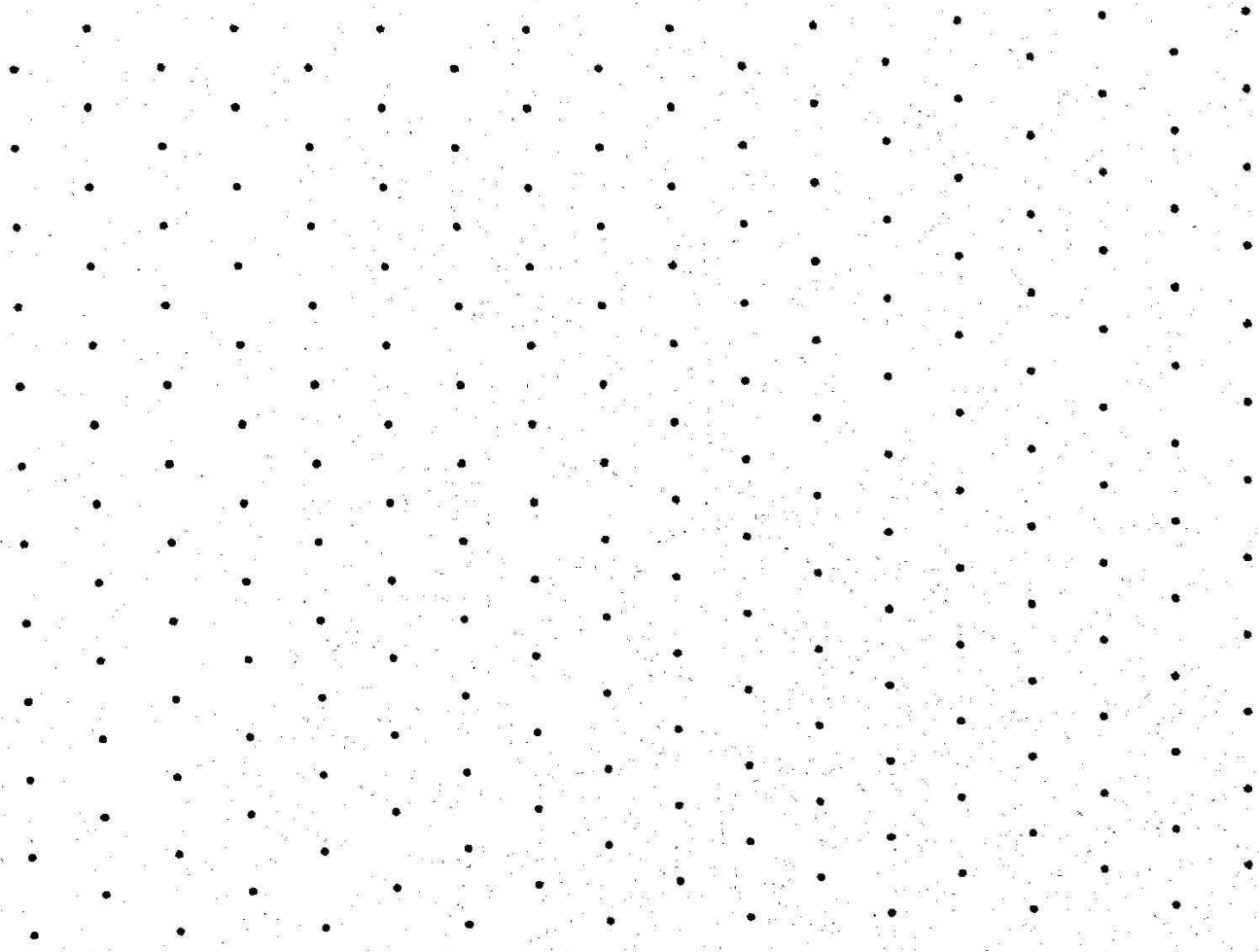How many tonnes of hay does she eat in 20 days?

Answer: .... t (2)

9. A large block of fudge is in the shape of a cuboid measuring 6 centimetres by 4 centimetres by 3 centimetres.

(i) Make a drawing of the cuboid on the centimetre isometric paper below:
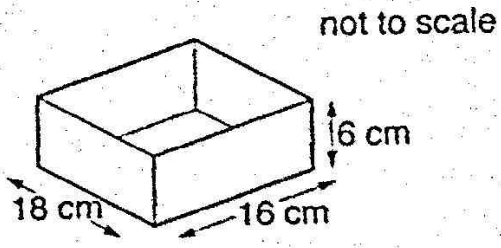
(2)

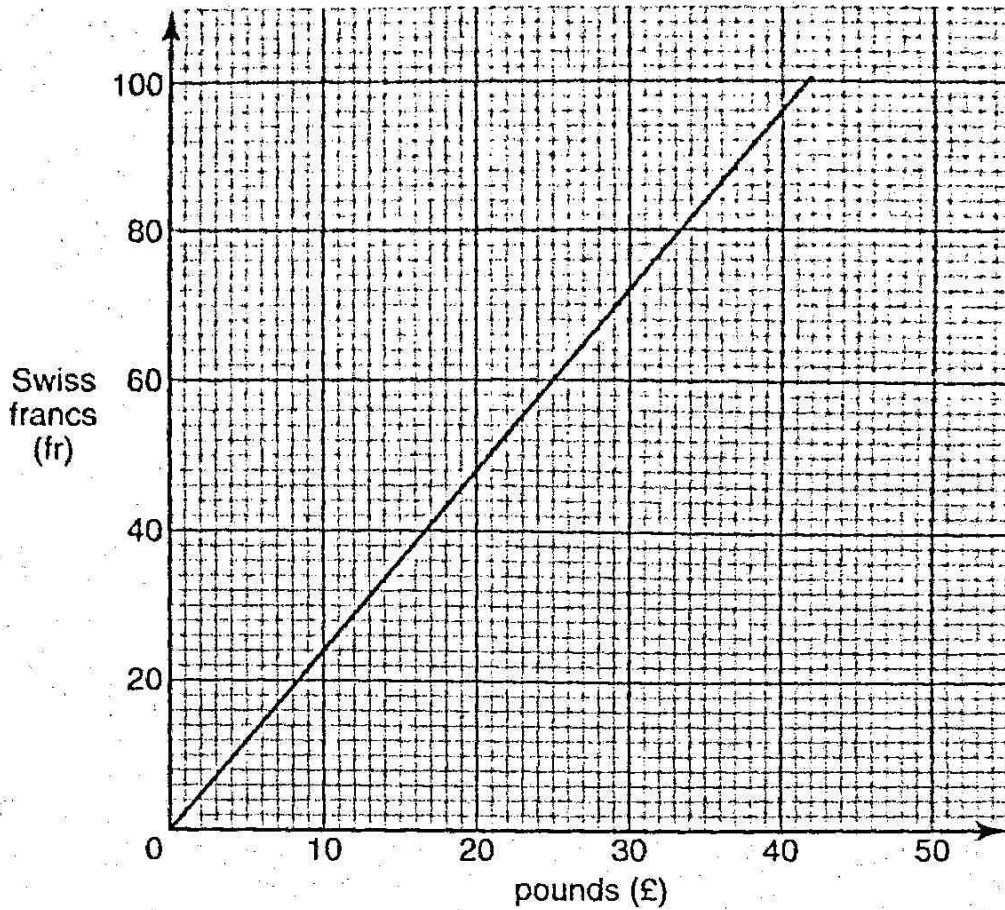(ii) Calculate the volume of the block of fudge.

Answer: .... cm³   (2)

These blocks are packed in boxes which measure 18 cm by 16 cm by 6 cm.

(iii) How many blocks fill a box completely?   not to scale

6 cm

18 cm   16 cm

Answer: ....   (2)

Turn over

10.

The graph above converts pounds (£) to Swiss francs (fr).

Use the graph to answer the following questions, showing clearly where you take your readings.

(i) A cuckoo clock is priced at 90 francs.
   What is this price in pounds?

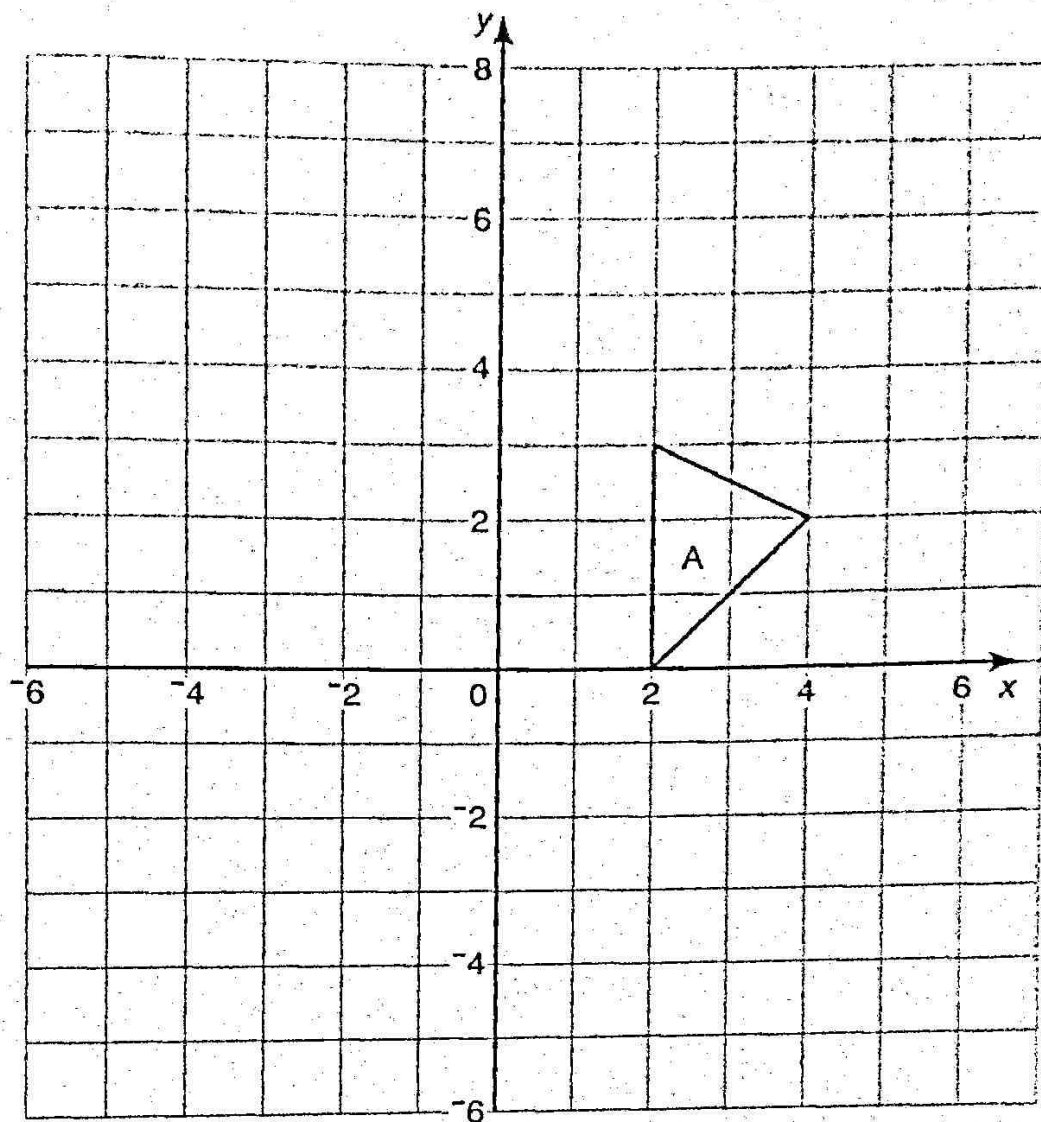Answer: £ .... (2)

(ii) An identical box of chocolates costs £11 in England and 32 francs in Switzerland.
   Where are the chocolates more expensive? *(Remember to show working.)*

Answer: .... (2)

(iii) What is the rate of exchange? (i.e. how many Swiss francs would you receive for £1?)

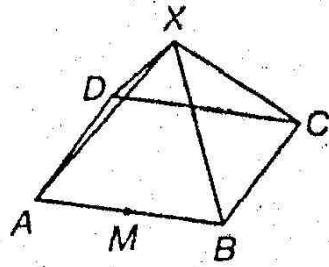Answer: .... fr   (2)

11.

On the grid above

(i) draw and label the line $y = {}^-1$ (1)

(ii) reflect triangle A in $y = {}^-1$ and label the image B   (1)

(iii) rotate triangle A 90° anticlockwise about $({}^-2, 0)$ and label the image C   (2)

(iv) translate triangle A *5 units left* followed by *3 units down* and label the image D.   (2)

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12. *XABCD* is a square-based pyramid.

$AB = BC = CD = DA = 6$ centimetres

$XA = XB = XC = XD = 5$ centimetres

not to scale

(i) Draw an accurate net of the pyramid below.
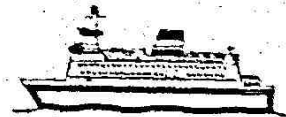
(ABCD has been drawn for you.)
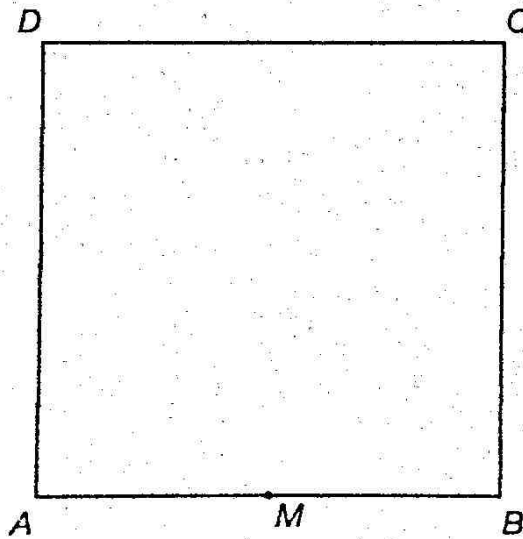
(3)

(ii) In triangle *XAB*, *M* is the mid-point of *AB*.
Calculate the length of *MX*, showing all your working.

Answer: .... cm   (3)

(iii) Calculate the area of the net.

O

Answer: .... cm²   (3)

13. (a) A ferry leaves Weymouth at 22 45 and arrives in the Channel Islands at 03 20 next day.
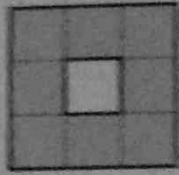How long does the voyage last?

O

Answer: .... h .... min   (2)

(b) George runs 400 metres in 50 seconds at a steady pace.
What is his average speed in kilometres per hour?
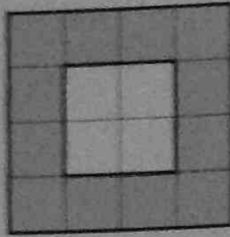
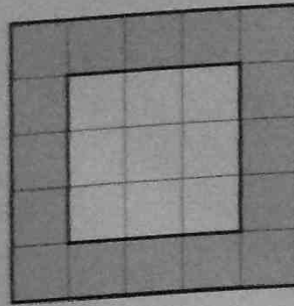Answer: .... km/h   (3)

14. The patterns below are made up of a frame of squares, which are shaded, surrounding a number of unshaded squares.
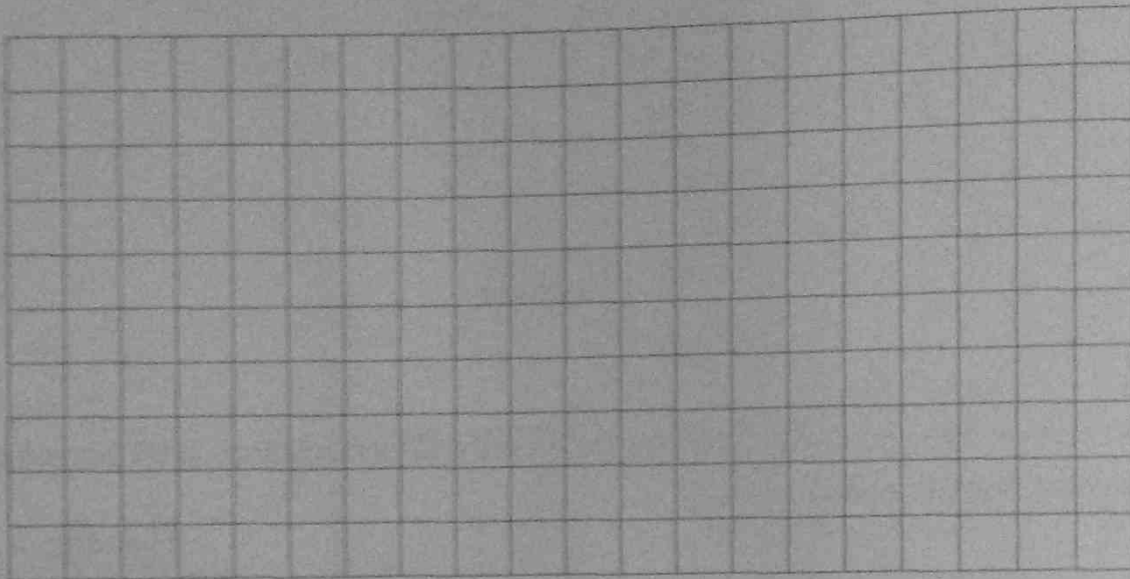

pattern 1   pattern 2   pattern 3

(i) Draw pattern 4 below:

(1)

(ii) Complete the table below:

pattern number	1	2	3	4
number of unshaded squares	1		9	
number of shaded squares	8	12		
total number of squares	9			

(3)

(iii) How many unshaded squares are there in pattern 20?

Answer: .... (1)

(iv) How many shaded squares are there in the *n*th pattern?

Answer: .... (1)

(v) A pattern has 144 unshaded squares.

How many shaded squares are there in the pattern?

Answer: .... (2)

(vi) What is the number of the first pattern to have a total of more than 1000 squares?

Answer: .... (2)

(Total marks: 100)