

SURNAME
(Block capitals, please)
JUNIOR SCHOOL

FIRST NAME
SENIOR SCHOOL



Independent Schools
Examinations Board

COMMON ENTRANCE EXAMINATION AT 13+

MATHEMATICS

PAPER 2

Non-Calculator Paper

Monday 4 June 2007

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. Calculate

(i) $3.6 + 1.82$

Answer: (1)

(ii) $3.6 - 1.82$

Answer: (1)

(iii) 7.62×0.6

Answer: (2)

(iv) $7.62 \div 0.6$

Answer: (2)

2. (a) Write 0.8 as a percentage.

Answer:% (1)

(b) Write $\frac{5}{8}$ as a decimal.

Answer: (2)

(c) Write 24 minutes as a fraction of 2 hours.

Answer: (2)

(d) Calculate $12\frac{1}{2}\%$ of £6.00

Answer: pence (2)

3. (a) A jar contains 450 grams of jam.
How many kilograms of jam are there in a case of 24 jars?



Answer: kg (3)

- (b) 330 millilitres of water fills a glass.

Estimate the number of these glasses which can be filled from a 5-litre container of water.



Answer: (2)

4. (a) Calculate

$$12 + 6 \div (3 - 1)$$

Answer: (2)

(b) You are given that $146 \times 48 = 7008$
Use this to work out

(i) 1.46×0.048

Answer: (1)

(ii) $7008 \div 24$

Answer: (2)

(c) By using prime factors, or otherwise, find the largest number that divides into both 126 and 54

Answer: (3)

5. When $p = 2$ $q = -3$ and $r = 4$
find the value of

(i) $2q - p$

Answer: (2)

(ii) $\frac{p-r}{pq}$

Answer: (2)

(iii) $p^3 - qr$

Answer: (2)

(iv) $\frac{(p+r)^2}{4q}$

Answer: (2)

6. (a) Solve the following equations:

(i) $2(a - 5) = -7$

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

(ii) $\frac{2b}{3} + 1 = 13$

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

(b) Solve the following inequalities:

(i) $c^3 \leq 64$

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

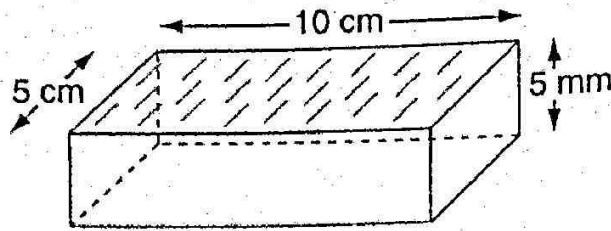
(ii) $3 - 2c < 11$

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

(iii) What is the largest prime number value of c which satisfies both parts (b) (i) and (b) (ii)?

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

7.



not to scale

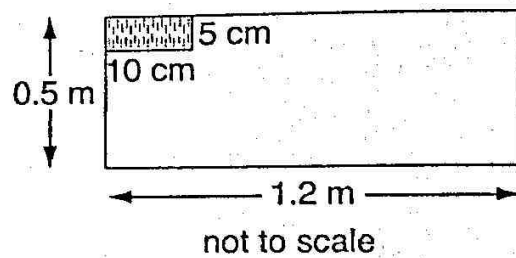
The top of a tile is a 10 cm by 5 cm rectangle. The tile is 5 mm thick.

(i) Calculate the volume of the tile.

Answer: cm^3 (1)

Mr Grout has a rectangular table top which measures 1.2 m by 0.5 m. He covers the table top with these tiles as shown below.

(ii) How many tiles does he need?



Answer: (2)

(iii) Tiles are sold in boxes of 25 and each box costs £4.95

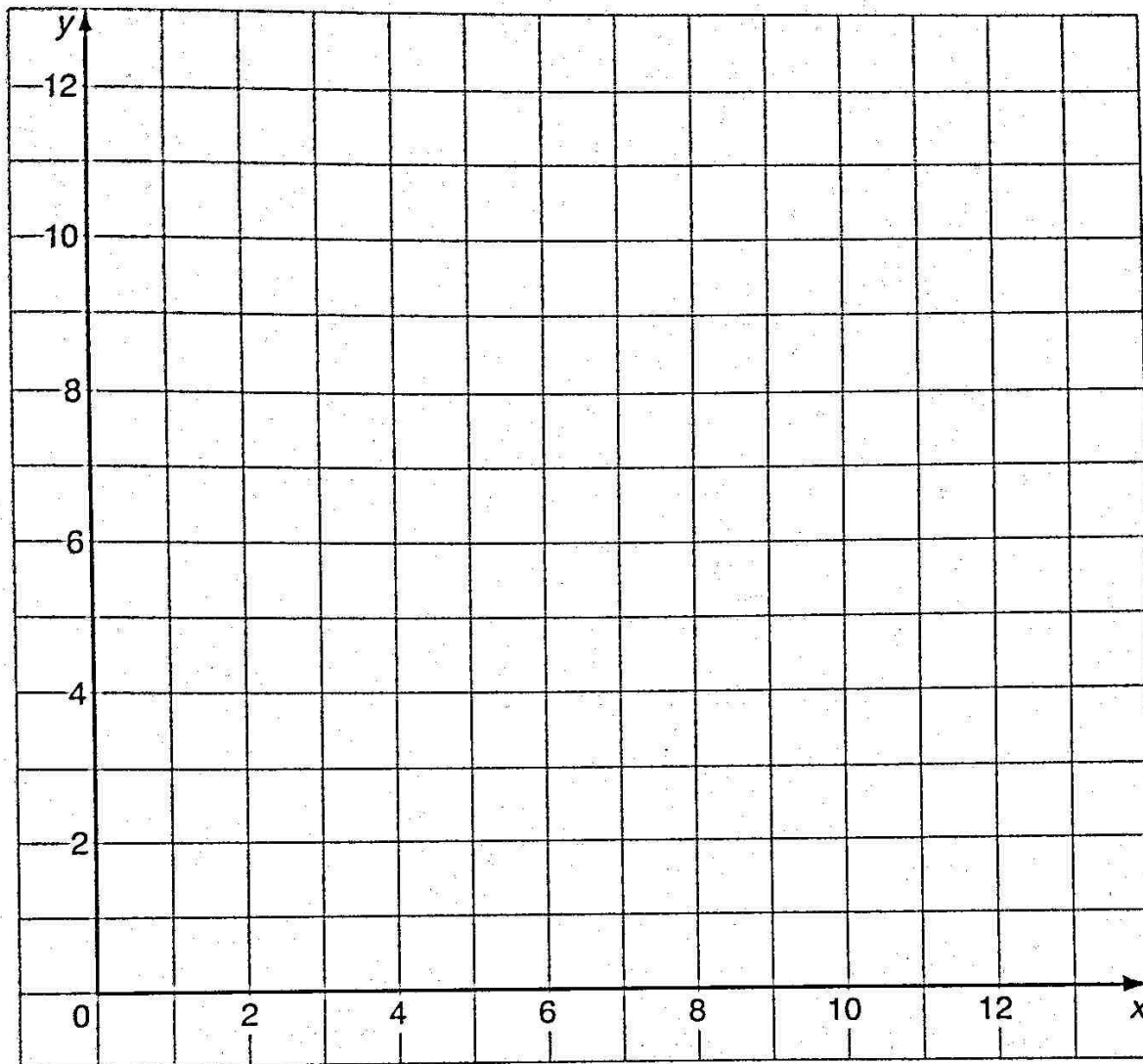
(a) How many boxes of tiles does Mr Grout need?

Answer: (2)

(b) How much does Mr Grout pay for the boxes of tiles altogether?

Answer: £ (1)

8.



- (i) On the grid above plot the points (4,2), (7,1) and (5,5).
Join them to form triangle A. (1)
- (ii) Draw and label the line $y = x$ (1)
- (iii) Reflect triangle A in the line $y = x$ and label the image B. (2)
- (iv) Rotate triangle A through 90° clockwise about centre (8,2) and label the image C. (2)
- (v) Translate triangle A 1 unit to the left followed by 7 units up and label the image D. (2)

9. Anna has a 10p coin, a 20p coin and a 50p coin.
She is going to toss all three coins at the same time.

(i) Complete the table below to show all the possible sets of heads (H) and tails (T).

Some have been filled in for you.

10p	20p	50p
H	H	H
H	H	T
T	T	T



(2)

(ii) Use your table to state the probability that Anna will toss

(a) one head and two tails in any order

Answer: (1)

(b) at least one tail

Answer: (1)

(c) an odd number of heads.

Answer: (1)

10. (a) Lucky Jim wins £1500 for being 'Schoolmaster of the Year'.
He spends $\frac{3}{5}$ of this sum taking his wife on holiday.



(i) How much does he spend on the holiday?

Answer: £..... (2)

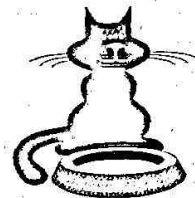
Jim shares the rest of the winnings equally between his 4 children.

(ii) What fraction of Jim's total winnings does each child receive?

Answer: (2)

(b) Tom's cat drinks $\frac{3}{4}$ of a litre of milk each day.

(i) How many litres of milk will Tom's cat drink in 24 days?



Answer: litres (2)

(ii) How long will 12 litres of milk last Tom's cat?

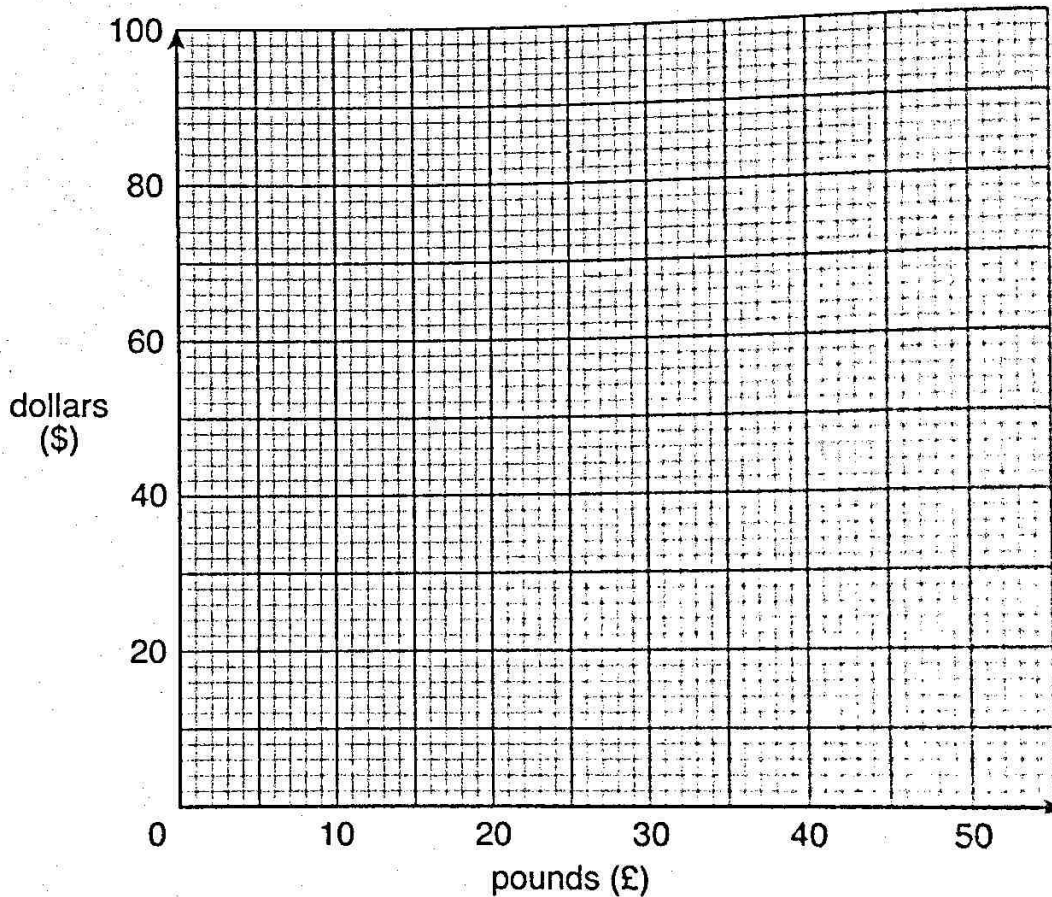
Answer: days (2)

11. When Mickey visited America, 1 pound (£) was worth 1.80 dollars (\$).

(i) How many dollars were worth the same as £50?

Answer: \$..... (1)

(ii) On the grid below, draw a graph to convert pounds to dollars for sums up to £50 (2)



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

(iii) (a) How many pounds were worth the same as \$50?

Answer: £..... (2)

(b) The same tie cost £37.50 in London and \$60 in New York. Where was it cheaper for Mickey to buy the tie?

Answer: (2)

12. (i) How many kilometres does 1 centimetre represent on a map drawn with the scale 1:50 000?

Answer: km (1)

- (ii) Queenstown (*Q*) is 4 km north-west of Princeville (*P*).

- (a) Using a scale of 1:50 000 plot the position of *Q* on the diagram below.



(2)

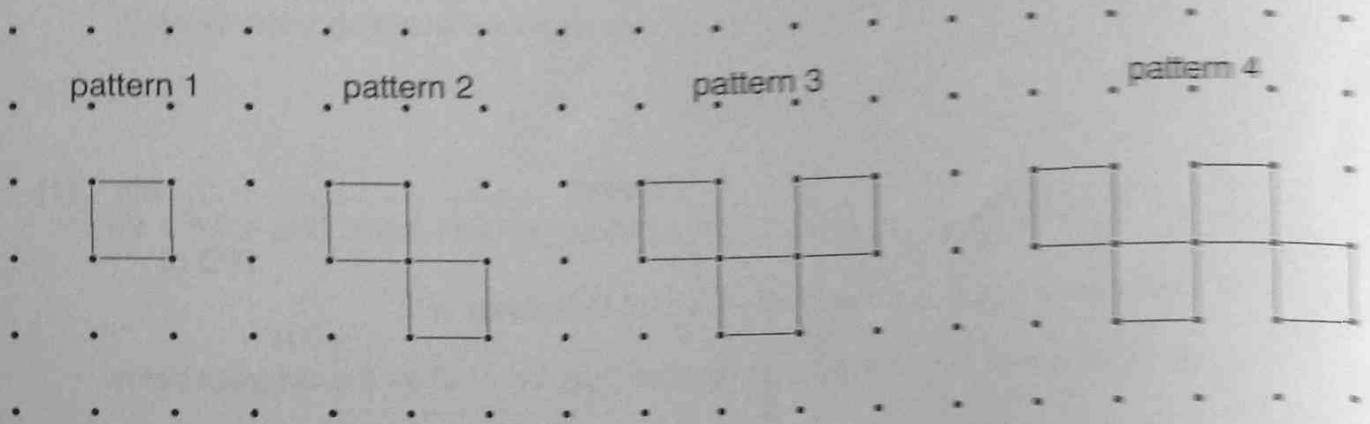
Roychester (*R*) is on a bearing of 015° from Princeville and 4.5 km from Queenstown.

- (b) Plot the position of Roychester. (3)

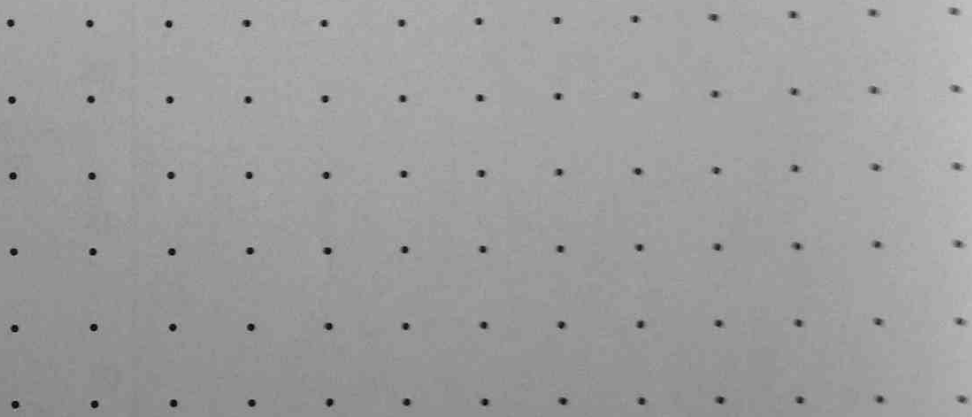
- (c) What is the distance from Roychester to Princeville?

Answer: km (2)

13. Here are the first four patterns in a sequence.



(i) Draw pattern 5 below.



(1)

(ii) Complete the table below.

pattern number	1	2	3	4	5	n
number of lines	4	8				
number of dots	4	7				
number of lines and dots	8	15				

(4)

(iii) What is the number of the pattern which has

(a) 64 lines

Answer: (1)

(b) 100 dots?

Answer: (1)

(iv) What is the number of lines and dots in pattern 13?

Answer: (1)

(v) What is the pattern number if the difference between the number of lines and the number of dots is 50?

Answer: (2)

14. Simon thinks of two numbers. The first number is x and the second number is y . When he doubles the first number and subtracts the second number the answer is $5\frac{1}{2}$.

(i) Write down an equation, in terms of x and y , to show this.

Answer: (1)

When he doubles the second number and subtracts the first number the answer is 1.

(ii) Write down an equation, in terms of x and y , to show this.

Answer: (1)

(iii) Solve the equations and hence find Simon's original numbers.

Answer: $x = \dots\dots\dots$ and $y = \dots\dots\dots$ (4)