SURNAME ..... FIRST NAME .....

JUNIOR SCHOOL ..... SENIOR SCHOOL .....

ISEB

Independent Schools
Examinations Board

COMMON ENTRANCE EXAMINATION AT 13+

MATHEMATICS

LEVEL 2: NON-CALCULATOR PAPER

Monday 26 January 2015

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.
- You must show all your working or you may receive no marks.
- Answers given as fractions should be reduced to their lowest terms.

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1. (a) Ann has £19.25 and Beth has £9.89

How much money do Ann and Beth have in total?

Answer: £ ..... (2)

(b) Colin has £21.32 and then he buys a bag which costs £8.73

How much money does Colin have left?

Answer: £ ..... (2)

(c) A box of pens costs £3.25

How much would it cost to buy 8 of these boxes of pens?

Answer: £ ..... (2)

(d) 8 identical boxes of pencils cost £28 altogether.

How much does 1 box of these pencils cost?

Answer: £ ..... (2)

S.A

2. Dan is 18 years old and Emma is 24 years old.

(i) Write down the ratio of Dan's age to Emma's age in its simplest form.

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

Mother shares £350 between Dan and Emma in the ratio of their ages.

(ii) How much does Dan receive?

Answer: £ ..... (2)

3. Work out the value of

(i) $^{-}4 + 8 \times 5$

Answer: ..... (2)

(ii) $5 \times \sqrt{9} + 7$

Answer: ..... (2)

4. (a) Work out 55% of £96

Answer: £ ..... (2)

(b) Jessica's first throw of a javelin is 33 metres.
Her second throw is 20% longer.

How long is Jessica's second throw?

Answer: ..... m (2)

(c) (i) Write $\frac{9}{20}$ as a percentage.

Answer: ..... % (2)

(ii) Write the following numbers in order of size, starting with the smallest.

55% $\frac{9}{20}$ 0.505

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

5. (i) Write the number 32 as a product of its prime factors.

Answer: ..... (2)

(ii) Use your answer to part (i) to write 320 as a product of its prime factors.

Answer: ..... (1)

6. You are told that $654 \times 32.5 = 21\,255$

Use this fact to work out

(i) 654×3.25

Answer: ..... (1)

(ii) 655×32.5

Answer: ..... (2)

(iii) $21\,255 \div 3.25$

Answer: ..... (1)

7. (i) Write each of the numbers in the following calculation correct to 1 significant figure.

$$\frac{305 \times 6.123}{0.499}$$

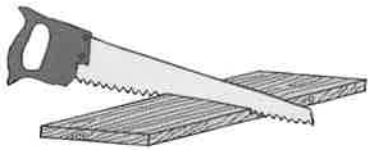
Answer: $\frac{\text{.....} \times \text{.....}}{\text{.....}}$ (2)

(ii) Use your answer to part (i) to estimate the value of:

$$\frac{305 \times 6.123}{0.499}$$

Answer: ..... (2)

8. Paul is building a bookcase.
All the shelves are $\frac{3}{8}$ of a metre long.
Paul has a piece of wood which is $\frac{17}{20}$ of a metre long.
He cuts 1 shelf from this piece of wood.



(i) What fraction of a metre of wood is left over?

Answer: ..... m (2)

He then cuts another shelf from what is left over.

(ii) What is the length, in centimetres, of the piece of wood that remains?

Answer: ..... cm (2)

Paul buys a piece of wood which is 3 metres long.

(iii) How many shelves can he cut from this piece?

Answer: ..... (2)

9. (i) At 9 am the temperature in Alaska is $-12.7\,^{\circ}C$ and in Washington it is $-2.9\,^{\circ}C$.

(a) What is the difference between these two temperatures?

Answer: ..... °C (1)

By noon, the temperature in Washington has risen by $4.5\,^{\circ}C$.

(b) What is the temperature in Washington at noon?

Answer: ..... °C (1)

(ii) There are two different temperature scales: Celsius (°C) and Fahrenheit (°F).
To convert Celsius to Fahrenheit *multiply by* $\frac{9}{5}$ *then add 32*

(a) If the temperature is $35\,^{\circ}C$, what is the temperature in Fahrenheit?

Answer: ..... °F (2)

(b) If the temperature is $50\,^{\circ}F$, what is the temperature in Celsius?

Answer: ..... °C (2)

10. If $x = 2$ $y = -2$ and $z = 6$ find the value of

(i) $7x + 4y$

Answer: ..... (2)

(ii) xyz

Answer: ..... (2)

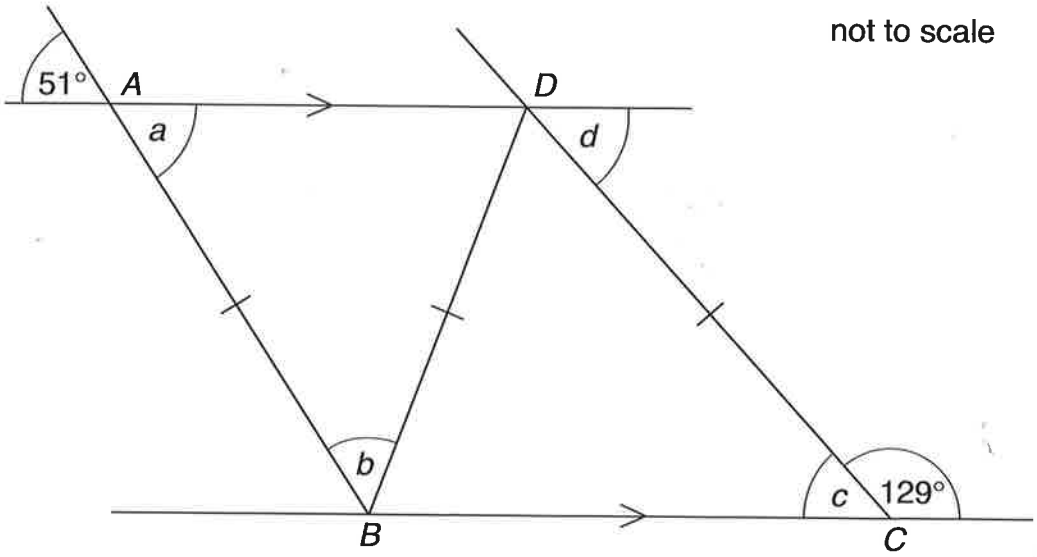
(iii) $z - y^3$

Answer: ..... (2)

(iv) $2z^2$

Answer: ..... (2)

11. (i) Work out the size of each of the angles marked *a*, *b*, *c* and *d* in the diagram below.



Answer: a = ... ° (1)

b = ... ° (2)

c = ... ° (1)

d = ... ° (1)

(ii) Is shape *ABCD* a parallelogram?
Give a reason for your answer.

Answer: Yes/No reason: .....

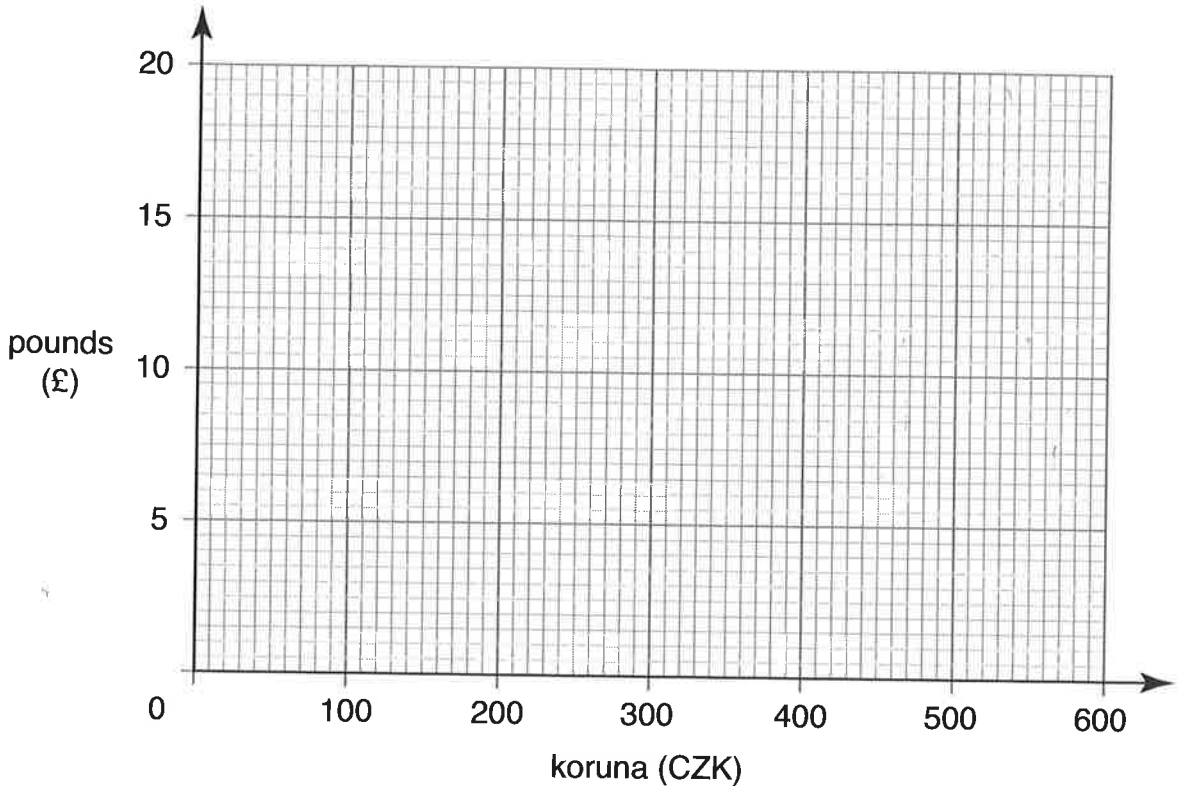
..... (2)

12. The currency in the Czech Republic is the koruna (CZK).
£1 is worth 28 CZK.

(i) What is £20 worth in CZK?

Answer: ..... CZK (1)

(ii) Draw a straight line on the grid below to convert CZK to £.



(2)

(iii) **Showing clearly where you take your readings**, use your graph to help you answer the following questions:

(a) How many CZK are worth £17.50?

Answer: ..... CZK (2)

(b) How many pounds are worth 420 CZK?

Answer: £ ..... (2)

(c) Tomas has 350 CZK.
James has £14

Who has more money and by how many pounds?

Answer: ..... by £ ..... (2)

13. (i) Using ruler and compasses, construct an equilateral triangle with sides of length 8 cm. (One side has been drawn for you already.)



(2)

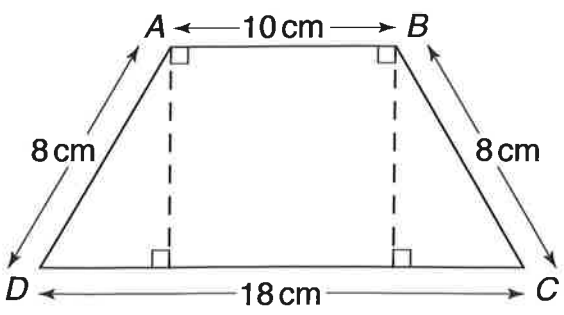
(ii) Draw a line of symmetry of the triangle as accurately as you can. (1)

(iii) By taking suitable measurements, calculate the area of the triangle.

Answer: ..... cm^2 (2)

Look at the shape *ABCD*.

(iv) What is the area of *ABCD*?



not to scale

Answer: ..... cm^2 (2)

14. A straight line has the equation $y = 3-2x$

(i) (a) Complete the table of values below for the line $y = 3-2x$

x	-1	1	3
y	5		

(2)

(b) Draw and label the line $y = 3-2x$ on the grid opposite. (1)

Another straight line has the equation $y = 3x-2$

(ii) (a) Complete the table of values below for the line $y = 3x-2$

x	-1	1	3
y			7

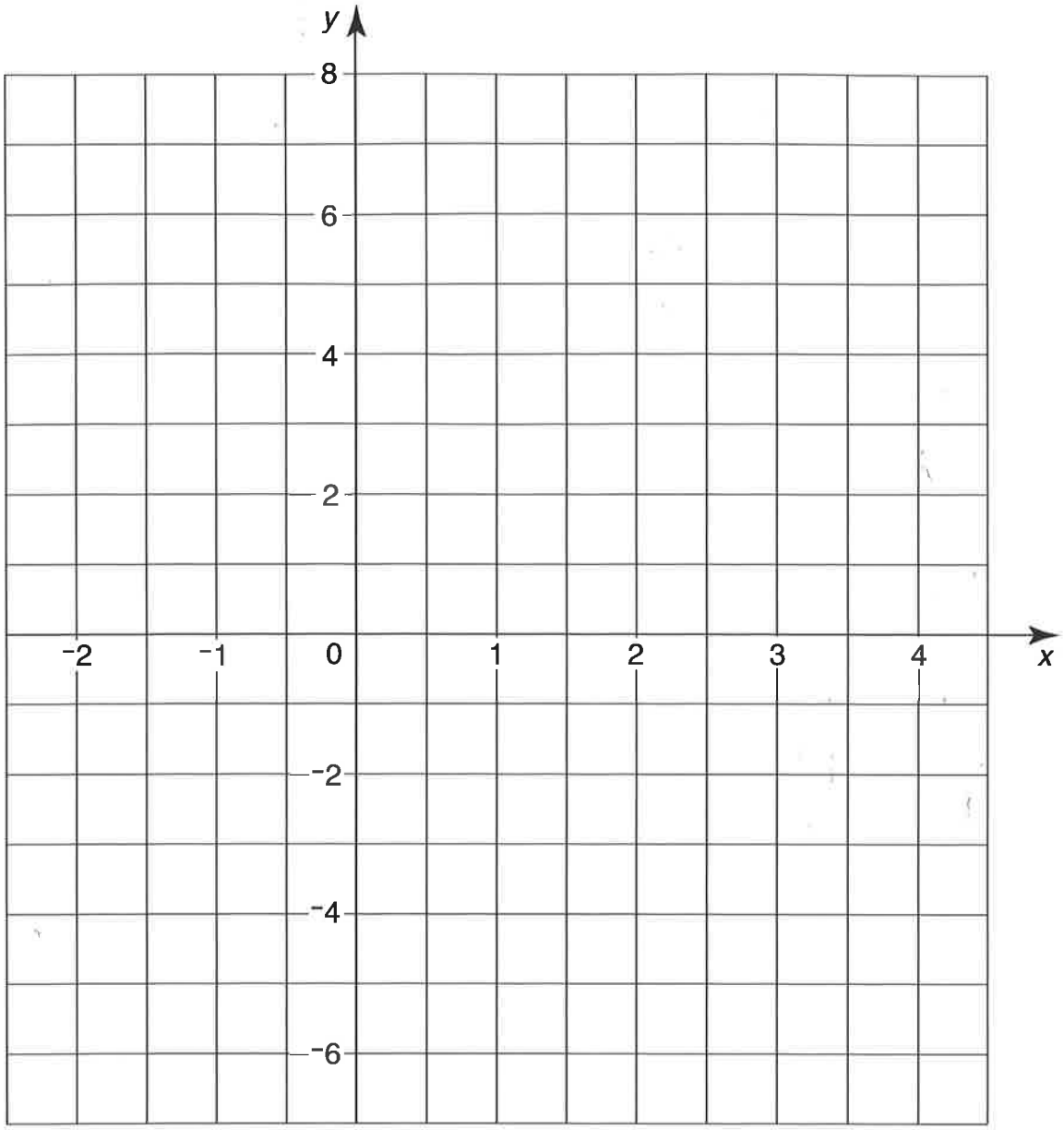
(2)

(b) Draw and label the line $y = 3x-2$ on the grid opposite. (1)

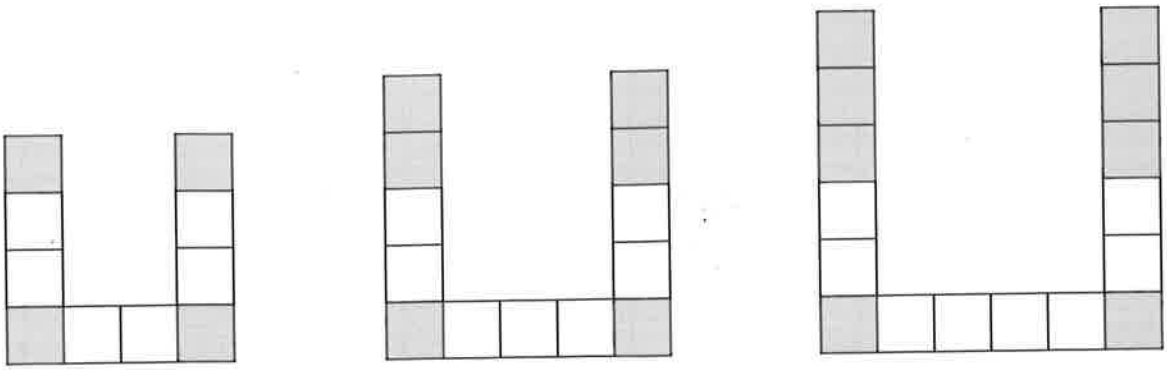
Look at the triangle formed by $y = 3-2x$, $y = 3x-2$ and the y axis.

(iii) How many points with integer co-ordinates lie on the perimeter of the triangle?

Answer: ..... (1)

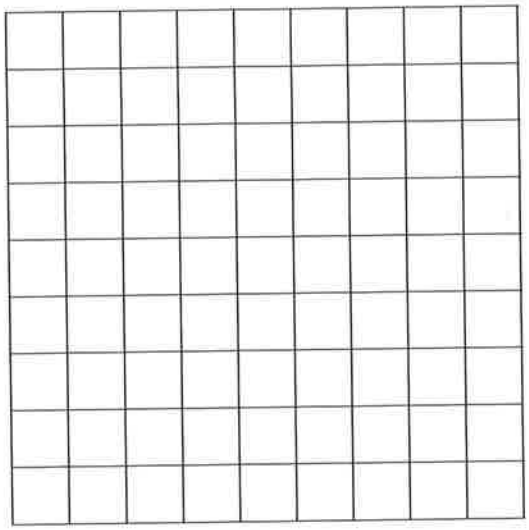

y
8
6
4
2
-2
-1
0
1
2
3
4
x
-2
-4
-6

15. The patterns below are made up of grey and white squares.



pattern 1 pattern 2 pattern 3

(i) (a) Draw pattern 4 in the grid below.



(1)

(b) Complete the table below to show the number of grey and white squares in each pattern.

pattern	1	2	3	4
grey squares	4			
white squares	6			

(2)

(c) How many grey squares are there in pattern 8?

Answer: ..... (1)

(d) In which pattern are there 16 white squares?

Answer: ..... (1)

(ii) The sequence of numbers below shows the total number of squares in each pattern.

10 13 16 19 ....

(a) What is the 8th term in this sequence?

Answer: ..... (1)

(b) Explain why the number 64 is in the sequence.

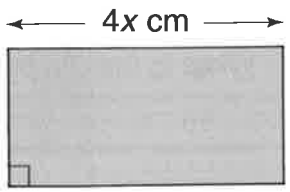
Answer: .....

..... (1)

TURN OVER FOR QUESTION 16

16. (a) Chris is building a patio using the rectangular paving blocks shown below.

(i) In terms of x, what is the perimeter of the block?
Simplify your answer.



not to scale

Answer: ..... cm (2)

(ii) The perimeter of the block is 90 cm.

(a) Using this information, write down an equation in terms of x

Answer: ..... (1)

(b) Solve your equation to find the value of x

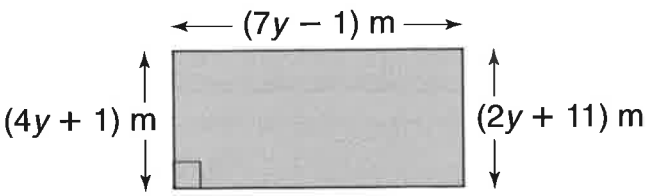
Answer: x = ... (1)

(iii) Calculate the area of the block.

Answer: ..... cm^2 (2)

(b) Matt is building a rectangular swimming pool and has drawn the plan of it below.

Form an equation from this information and solve it to find the value of y



not to scale

Answer: y = ... (2)

(Total marks: 100)