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

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

Independent Schools Examinations Board

COMMON ENTRANCE EXAMINATION AT 13+

MATHEMATICS

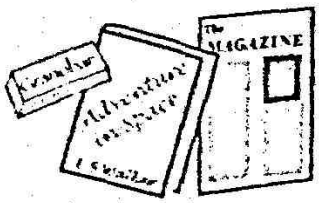
LEVEL 3: NON-CALCULATOR PAPER

Monday 25 January 2010

Please read this information before the examination starts.

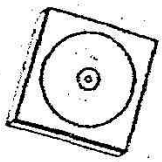
- This examination is 60 minutes long.
- All questions should be attempted.
- A row of dots ..... denotes a space for your answer.
- A completely correct answer may receive no marks unless you show all your working.
- Answers given as fractions should be reduced to their lowest terms.

1. (a) Find the total amount spent on a book costing £3.85, a magazine for £1.75 and a cereal bar costing 47p.



Answer: £ ..... (2)

(b) Jess buys a CD for £6.74
She pays with a £20 note.
How much change should she receive?

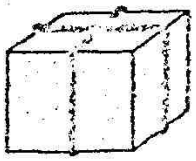


Answer: £ ..... (2)

(c) Calculate the cost of 7 birthday cards, each costing £1.89

Answer: £ ..... (2)

(d) The total mass of 5 identical parcels is 6.45 kilograms.
Calculate the mass of 1 parcel.



Answer: ..... kg (2)

2. (a) Calculate

(i) 15.6×0.2

Answer: ..... (2)

(ii) $15.6 \div 0.2$

Answer: ..... (2)

(b) Write 45 as a percentage of 360

Answer: ..... % (2)

(c) Put these numbers in order of size, starting with the smallest:

0.303 **$0.\dot{3}$** **33%** $\frac{3}{10}$

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

3. (a) Calculate

(i) $5 - 4 \times 3 - 2$

Answer: ..... (1)

(ii) $54 - 3^2 + 1$

Answer: ..... (1)

(b) (i) Write 132 as a product of its prime factors.

Answer: ..... (2)

(ii) Hence write 132^2 as a product of its prime factors, using indices.

Answer: ..... (2)

4. (a) Pete enjoys reading.

On Monday, he reads the first 48 pages of his new book.

This is $\frac{2}{7}$ of the total number of pages.

(i) How many pages are there in his book?

Answer: ..... (2)

On Tuesday, he reads $\frac{1}{2}$ of the remaining pages.

(ii) What fraction of the book does he read on Tuesday?

Give your answer in its simplest form.

Answer: ..... (2)

(b) Olivia uses $\frac{3}{5}$ of a ball of wool to make a glove.

How many gloves can she make with 15 balls of wool?

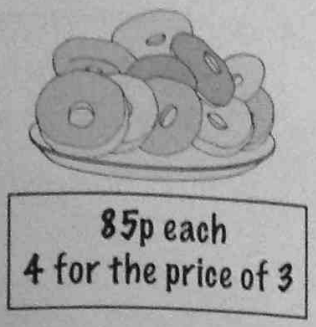
Answer: ..... (2)

(c) Rudolph eats $2\frac{2}{3}$ carrots each day.

How many carrots does he eat during the 12 days of Christmas?

Answer: ..... (2)

5. At *Doughnut Deli*, iced doughnuts cost 85p each.
A special offer gives 4 doughnuts for the price of 3
Amy needs 16 of these doughnuts.



(i) How much does she pay for 16 doughnuts?

Answer: £ ..... (2)

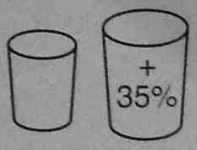
Her iced doughnuts are either chocolate or plain.
There are four more chocolate doughnuts than plain ones.

(ii) Write the ratio of chocolate doughnuts to plain doughnuts in its simplest form.

Answer: ..... (2)

Doughnut Deli also sells drinks.
A standard cup holds 300 millilitres of drink, and a large cup holds 35% extra.

(iii) How many millilitres of drink does a large cup hold?



Answer: ..... ml (2)

6. (a) If $c = 5$ $d = -3$ and $e = -2$ find the value of

(i) $c - 3d$

Answer: ..... (1)

(ii) de^2

Answer: ..... (2)

(iii) $(3d)^2$

Answer: ..... (2)

(iv) $\frac{2d + e}{2d - e}$

Answer: ..... (2)

(b) A formula used in physics is $v = u + at$

Find a when $v = 4$ $u = 10$ and $t = 2$

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

7. (a) Solve the following equations:

(i) $\frac{d+2}{5} = 10$

Answer: $d =$ ..... (1)

(ii) $\frac{2}{3}e - 5 = 7$

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

(iii) $11 - 4f = 2(3f - 2)$

Answer: $f =$ ..... (3)

(b) (i) Solve the inequality $10 - 3g < 4$

Answer: ..... (2)

(ii) What is the smallest even number which satisfies the inequality in part (b) (i)?

Answer: ..... (1)

8. Becky has some coloured counters in a bag.

The ratio of red : blue : green counters is 2 : 3 : 4

(i) Given that she has 12 green counters, calculate the total number of counters in the bag.

Answer: ..... (2)

(ii) If she picks a counter at random from the full bag, calculate the probability that

(a) she picks a red counter

Answer: ..... (1)

(b) she does not pick a green counter

Answer: ..... (1)

Becky's brother takes 3 blue counters from the full bag.

(iii) What fraction of the counters remaining in the bag are blue ones?

Answer: ..... (2)

9. Here is some information about the number of pets owned by each of the 18 children in David's class.

One child owns 7 pets.

number of pets owned	frequency
0	6
1	4
2	5
3	2
7	1
total	18

(i) What is the modal number of pets owned?

Answer: ..... (1)

(ii) What is the median number of pets owned?

Answer: ..... (1)

(iii) Calculate the mean number of pets owned.

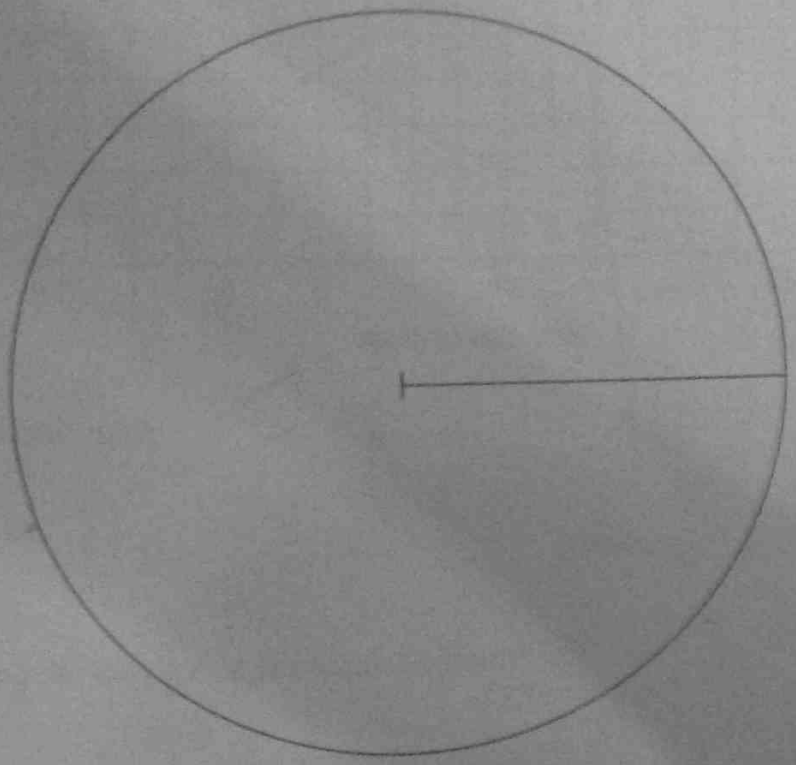
Answer: ..... (2)

David decides to draw a pie chart of the results.

(iv) (a) How many degrees represent each child?

Answer: ..... (1)

(b) Draw a fully-labelled pie chart to represent the data.



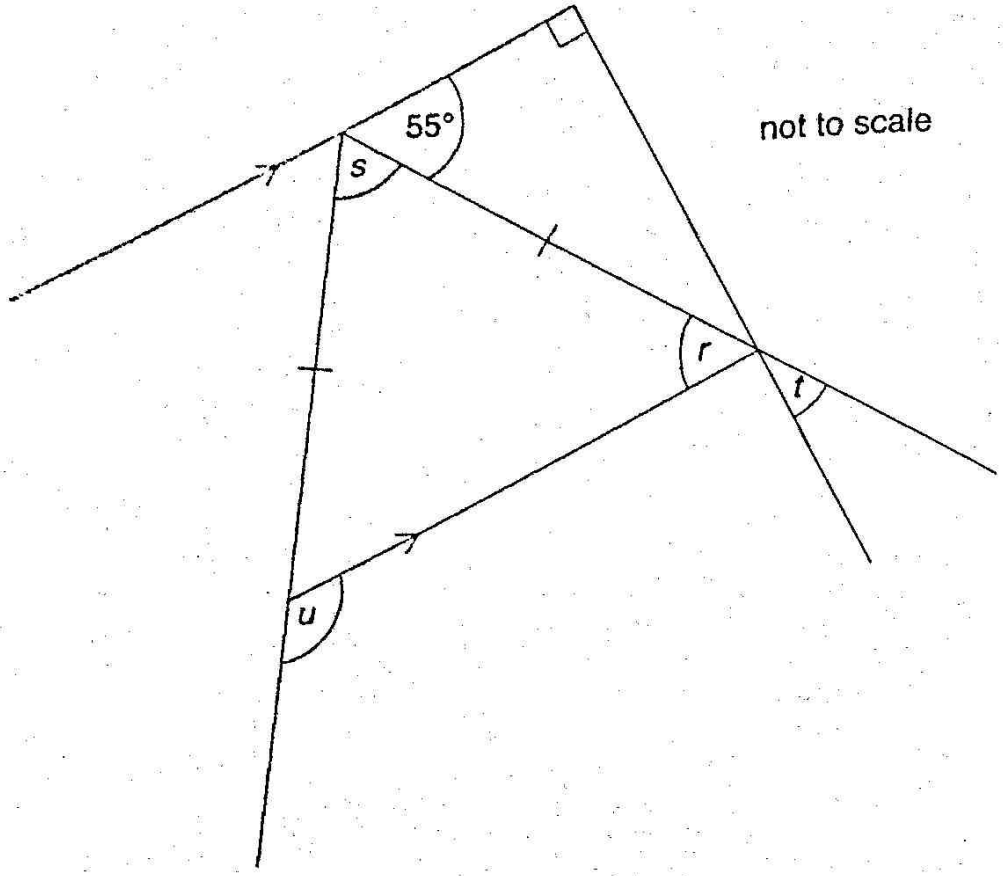
(3)

If the girl who owns 7 pets buys a new goldfish, she will then have 8 pets.

(v) Circle the names of any values which will change.

mean **median** **mode** **range** (2)

10. Calculate the size of each of the angles marked *r*, *s*, *t* and *u*.



not to scale

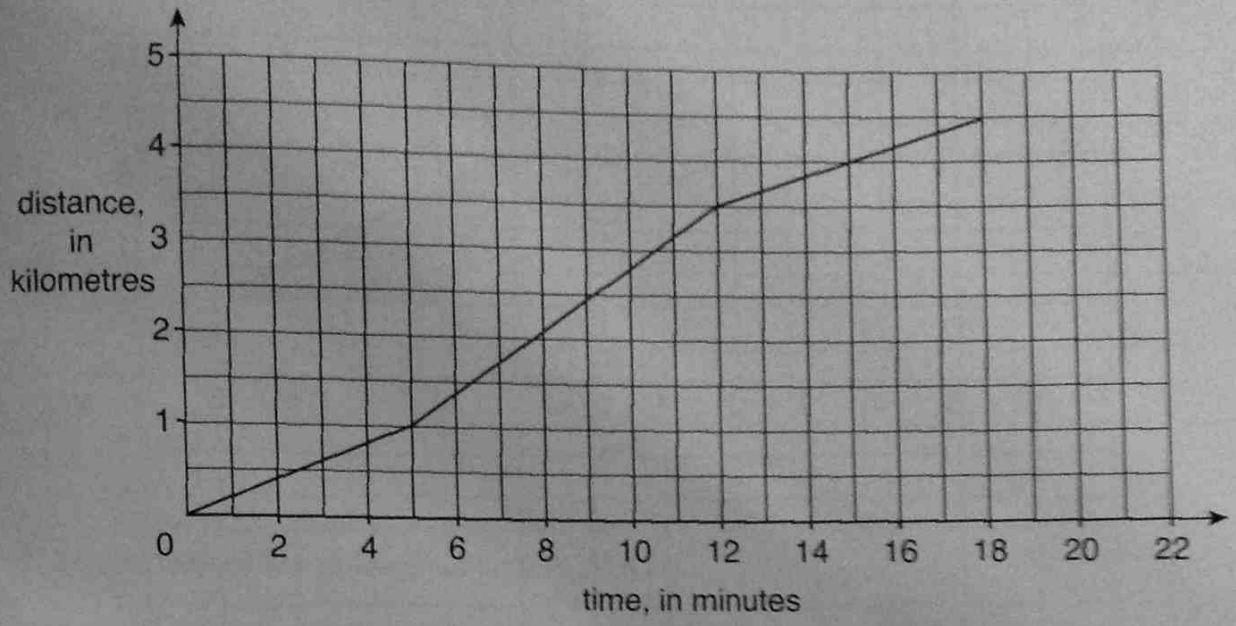
Answer: $r =$ ..... ° (1)

Answer: $s =$ ..... ° (1)

Answer: $t =$ ..... ° (2)

Answer: $u =$ ..... ° (1)

11. Every week Billy goes for a run.
The graph below shows his run last week.



(i) How far did Billy run?

Answer: ..... km (1)

(ii) For how long did Billy run at his fastest speed?

Answer: ..... min (1)

(iii) What was his average speed for the whole run

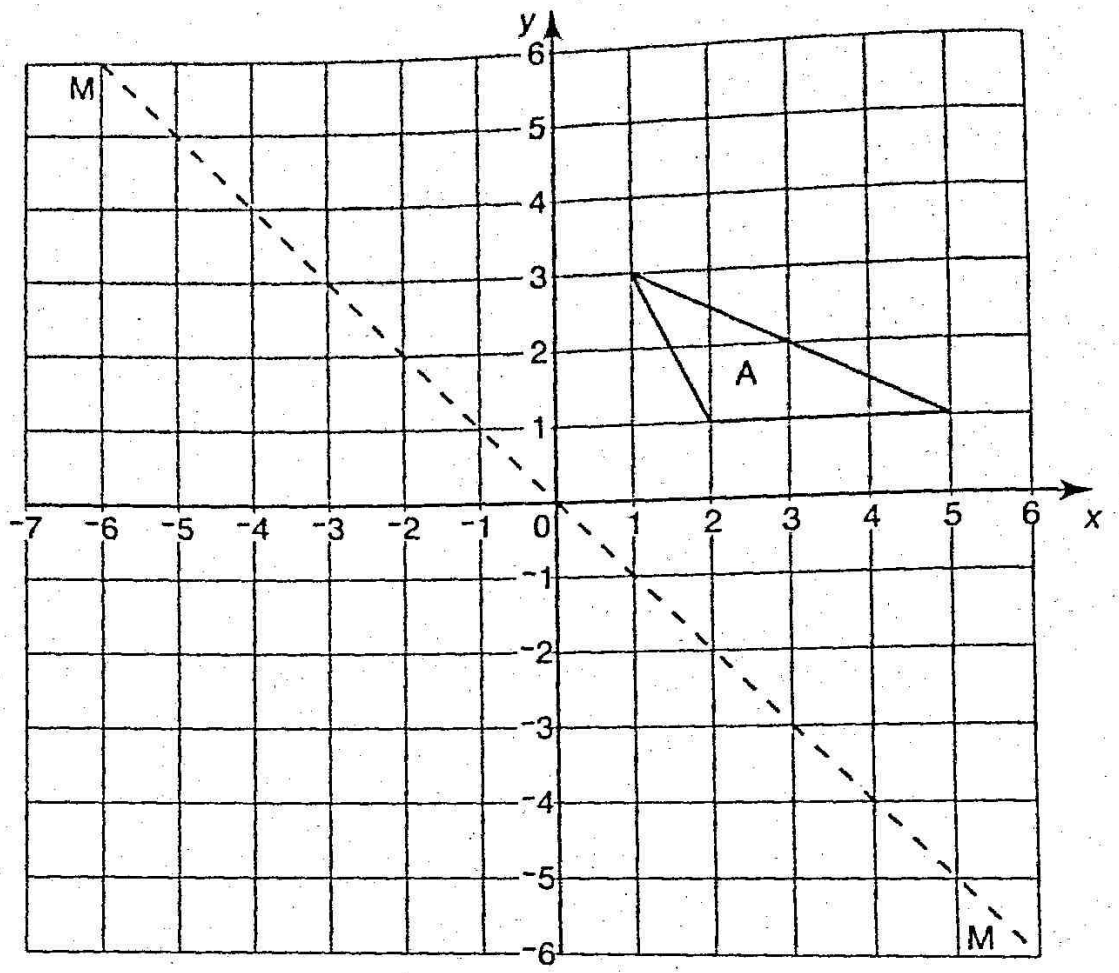
(a) in metres per minute?

Answer: ..... m/min (2)

(b) in kilometres per hour?

Answer: ..... km/h (2)

12. Triangle A is drawn on the centimetre-squared grid below.



(i) Calculate the area of triangle A.

Answer: ..... cm^2 (1)

(ii) (a) Write down the equation of the dashed line M drawn on the grid above.

Answer: ..... (1)

(b) Reflect triangle A in the dashed line M.
Label the image B.

(1)

(iii) Translate triangle A by *4 units left* and *2 units down*.
Label the image C.

(2)

(iv) Rotate triangle A through 180° about the point (3, 2).
Label the image D.

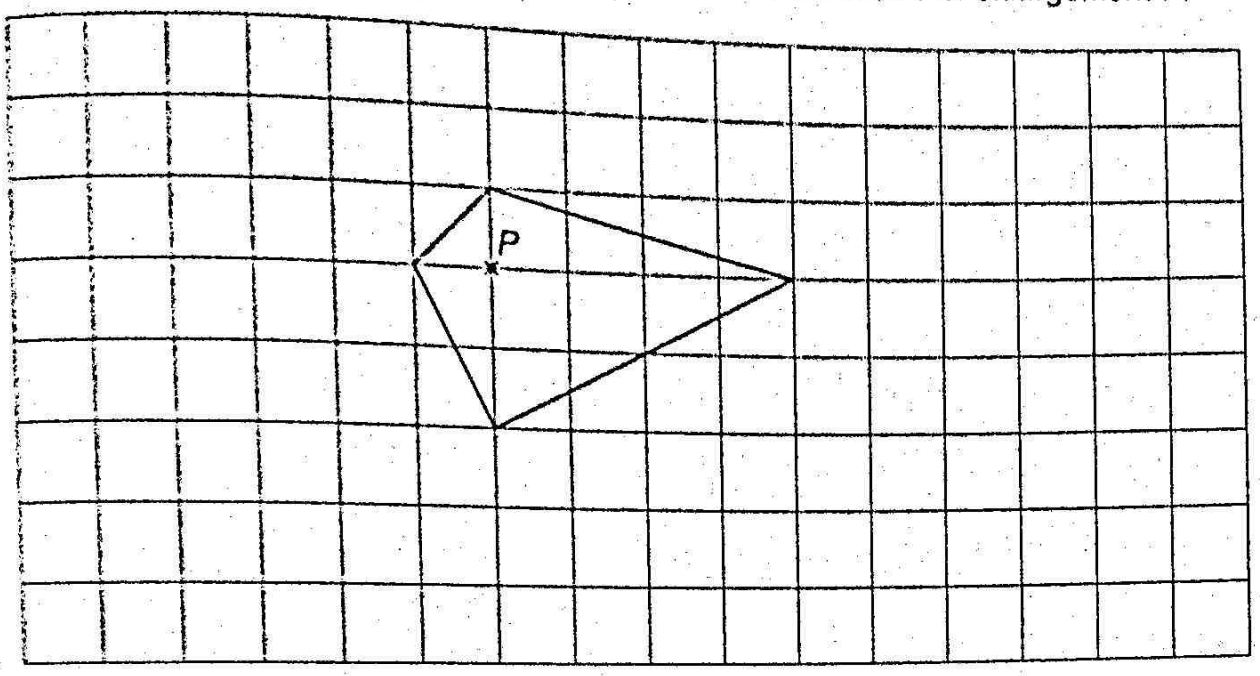
(2)

Look at the shape which is formed by triangles A and D together.

(v) Write down the number of lines of symmetry of this shape.

Answer: ..... (1)

13 (i) Enlarge the shape below with scale factor 2 about the centre of enlargement *P*.



(2)

The perimeter of the enlarged shape is 24.5 cm.

(ii) What is the perimeter of the original shape?

Answer: ..... cm (1)

The area of the original shape is 7.5 cm^2.

(iii) What is the area of the enlarged shape?

Answer: ..... cm^2 (1)

TURN OVER FOR QUESTION 14

14. (i) Calculate

(a) $\frac{1}{3} - \frac{1}{5}$

Answer: ..... (2)

(b) $\frac{1}{5} - \frac{1}{7}$

Answer: ..... (1)

A **unitary** fraction is one where the top of the fraction is 1, for example $\frac{1}{5}$ and $\frac{1}{7}$

(ii) Using your answers to part (i), or otherwise, write down two **unitary** fractions whose difference is

(a) $\frac{2}{99}$

Answer: ..... and ..... (1)

(b) $\frac{1}{40}$

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

(c) $\frac{3}{40}$

Answer: ..... and ..... (1)

(Total marks: 100)