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

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

Independent Schools Examinations Board

COMMON ENTRANCE EXAMINATION AT 11+

MATHEMATICS

Specimen Paper

(for first examination in Autumn 2016)

Please read this information before the examination starts.

- This examination is 60 minutes long.
- Please try **all** the questions.
- Write your answers on the dotted lines.
- All working should be written on the paper.
- Tracing paper may be used.
- Calculators are not allowed.
- Fraction answers should be given in their simplest form.

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1. Write down the answers to these questions.
(You may work them out in your head.)

(i) 48 + 35

Answer: ..... (1)

(ii) 613 − 123

Answer: ..... (1)

(iii) 28 ÷ 4

Answer: ..... (1)

(iv) 2^3

Answer: ..... (1)

(v) twenty-five percent of eighty

Answer: ..... (1)

(vi) 6.3 × 100

Answer: ..... (1)

(vii) 398 + 297

Answer: ..... (1)

(viii) 27 × 5

Answer: ..... (1)

2. (a) Write down all the prime numbers between 10 and 20

Answer: ..... (2)

(b) Write down the first three multiples of 12

Answer: ..... (1)

(c) Write down all the factors of 16

Answer: ..... (2)

3. A box of 7 grapefruit costs £3.29

(i) What is the cost of one grapefruit?
Give your answer in pence.

Answer: ..... p (2)

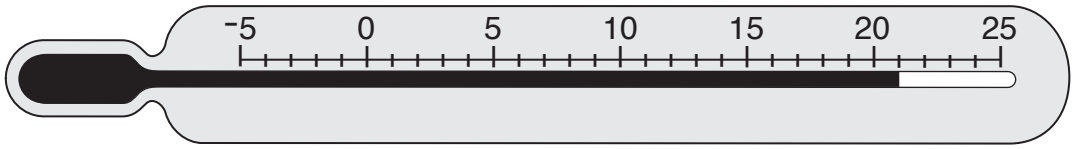
Patrick buys 2 boxes of grapefruit and pays with a £20 note.

(ii) How much change should he receive?

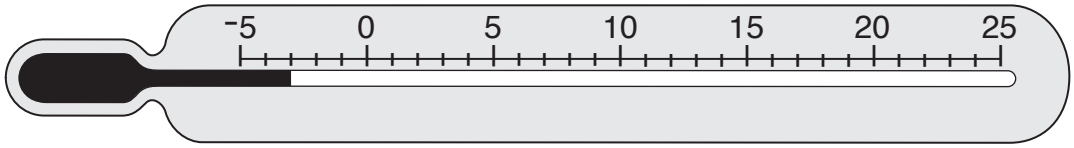
Answer: £ ..... (2)

4. These thermometers show the temperatures inside and outside a window at 10 a.m. one winter's day.

inside



outside



(i) How many degrees warmer was it inside than outside the window?

Answer: ..... °C (1)

At 10 p.m., the temperature outside had fallen by 2 °C.

(ii) What was the temperature outside the window at 10 p.m.?

Answer: ..... °C (1)

5. Fill in the boxes to make the following statements true.

(i) $8 + 4 \times \square = 36$

(1)

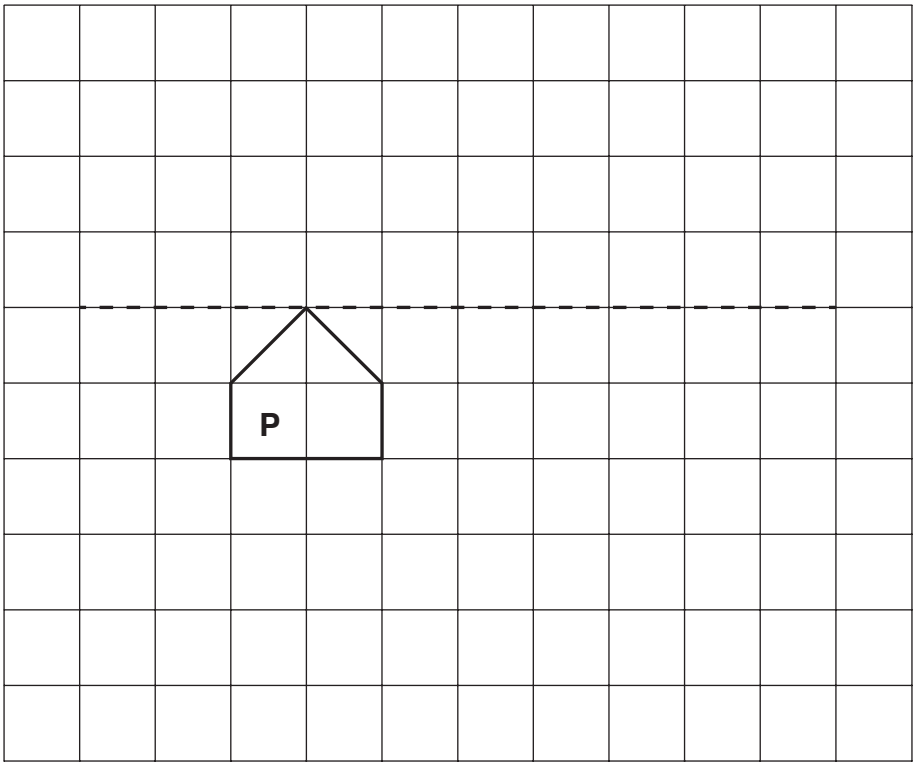
(ii) $5 \times (4 - \square) = 15$

(1)

(iii) $10 - (5 + \square) = -3$

(1)

6. Shape **P** is drawn on the centimetre-square grid below.



(i) Reflect shape **P** in the dashed line.
Label the new shape **Q**. (2)

(ii) Translate shape **P** *3 units right* and *4 units up*.
Label the new shape **R**. (2)

(iii) Work out the area of shape **P**.
Give your answer with the correct units.

Answer: ..... (2)

7. (a) Write down the value of these Roman numerals.

(i) V

Answer: ..... (1)

(ii) M

Answer: ..... (1)

(b) Which year is written in Roman numerals as MMXVII?

Answer: ..... (1)

8. (a) Work out the following.

(i) 3579 + 1824

Answer: ..... (2)

(ii) 3579 − 1824

Answer: ..... (2)

(iii) 264 × 27

Answer: ..... (3)

(iv) 1595 ÷ 11

Answer: ..... (2)

(b) Round 2089 to the nearest 100

Answer: ..... (1)

9. Calculate the mean of these numbers.

9 14 7 17 8

Answer: ..... (2)

10. Here is a list of fractions:

$\frac{3}{4}$ $\frac{5}{8}$ $\frac{15}{11}$ $\frac{8}{12}$ $\frac{4}{5}$

Choose from the list

(i) a fraction which is greater than 1

Answer: ..... (1)

(ii) a fraction equivalent to 80%

Answer: ..... (1)

(iii) a fraction equivalent to 0.75

Answer: ..... (1)

(iv) a fraction which is not in its simplest form

Answer: ..... (1)

11. A sunflower is 150 cm tall.

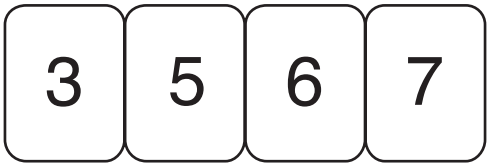
How tall will it be if its height increases by 10%?

Answer: ..... cm (2)

12. Here are 5 number cards:

The cards can be put together to form numbers.

For example, the smallest number which could be made using 4 of the cards is:



(i) Using all 5 cards

(a) what is the largest possible even number?

Answer: ..... (1)

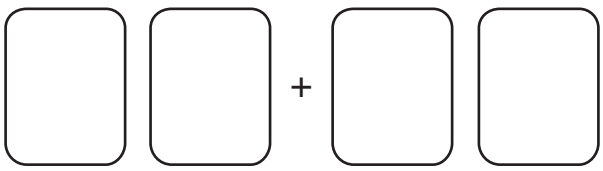
(b) what is the number which is closest to 80 000?

Answer: ..... (1)

(ii) Use exactly 2 of the cards to make the smallest possible prime number.

Answer: ..... (1)

(iii) Arrange any 4 of the cards to show a sum below which will give the smallest possible answer.



(1)

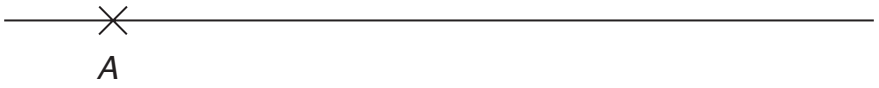
13. Put these distances in order from smallest to largest.

27.8 km 2.087 km 2 778 m 2.708 km

Answer: ....., ..., ..., ... (3)
smallest largest

14. (i) Draw accurately triangle *ABC* where *AB* = 5.5 cm, angle *A* = 45° and angle *B* = 90°

(*Point A is already drawn for you*.)



(3)

(ii) Measure and write down the length of side *BC*.

Answer: ..... cm (1)

(iii)

equilateral	isosceles	scalene	right-angled

Circle any appropriate words from the box above to describe triangle *ABC*.

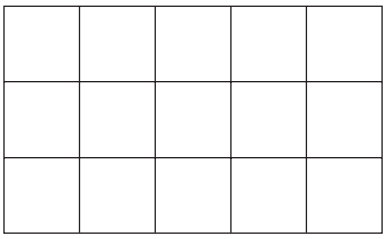
Give reasons for your answer.

.....

..... (2)

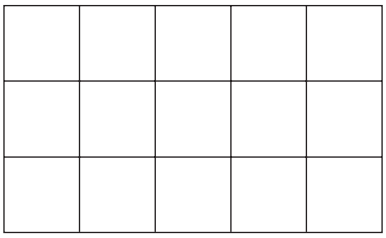
15. (i) Two identical rectangles are divided into 15 equal squares.

(a) Shade $\frac{3}{5}$ of this rectangle:



(1)

(b) Shade $\frac{2}{3}$ of this rectangle:



(1)

(c) Which is larger: $\frac{3}{5}$ or $\frac{2}{3}$.

Give a reason for your answer.

Answer: ..... because .....

.....

..... (2)

(ii) Arrange these fractions in order from **smallest** to **largest**.

$1\frac{1}{3}$ $\frac{2}{3}$ $\frac{4}{5}$ $\frac{13}{15}$ $\frac{3}{5}$

Answer: ....., ..., ..., ..., ... (2)
smallest largest

16. Work out

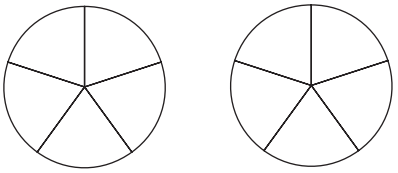
(i) $\frac{2}{3} - \frac{1}{6}$

Answer: ..... (2)

(ii) $\frac{2}{5} \times 3$

Write your answer as a mixed number.

(You may use the diagrams to help you.)



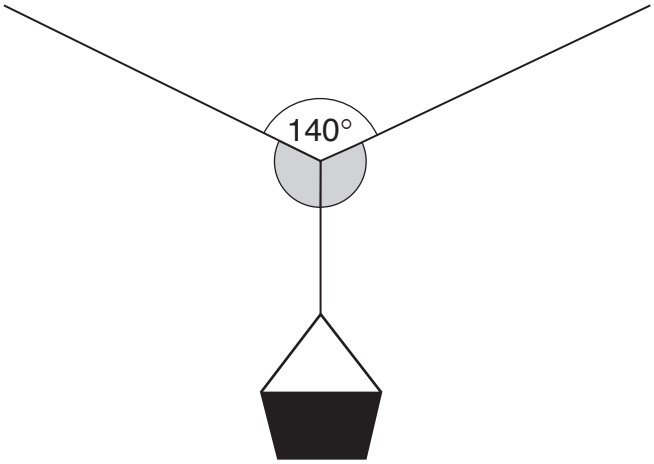
Answer: ..... (2)

17. In a box of 24 pens, one eighth are green, 25% are red and the rest are blue.

What fraction of the pens is blue?

Answer: ..... (3)

18. (a) Jake hangs a peg basket on a washing line.



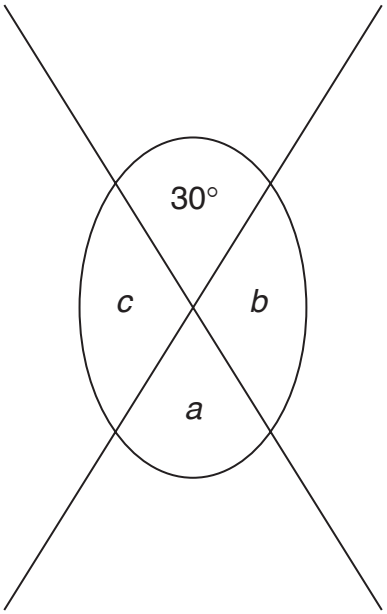
not to scale

Find the size of one of the shaded angles in the diagram above, if both are the same size.

Answer: .....° (2)

(b) The diagram below shows two straight lines.

Find the sizes of the angles marked *a*, *b* and *c*.



not to scale

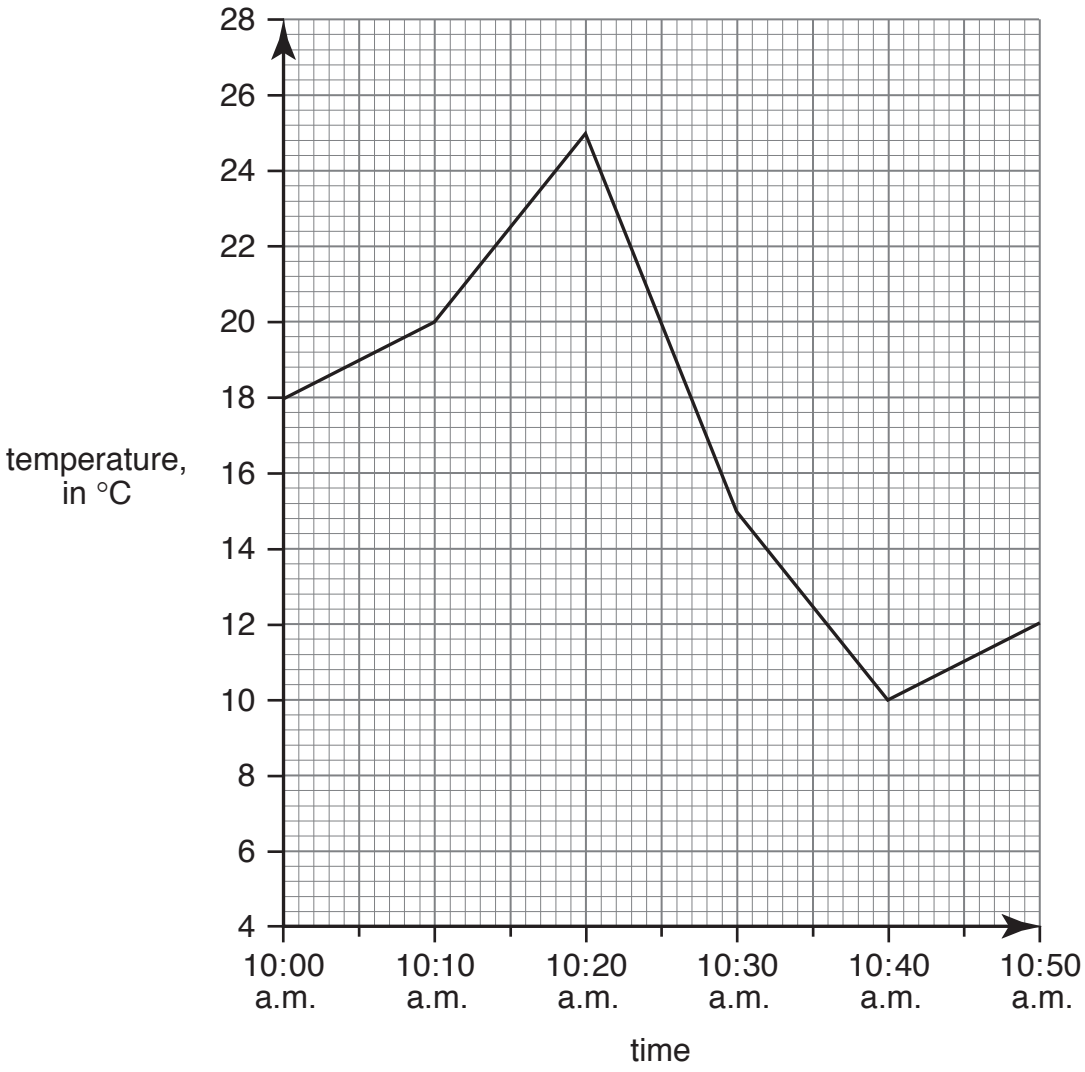
Answer: *a* = ... °

Answer: *b* = ... °

Answer: *c* = ... (3)

19. Sarah measured the temperature of a beaker of liquid every 10 minutes during a science experiment.

She plotted her results on the graph below.



(i) What was the lowest temperature of the beaker?

Answer: ..... °C (1)

(ii) At what time was the temperature of the beaker 15 °C?

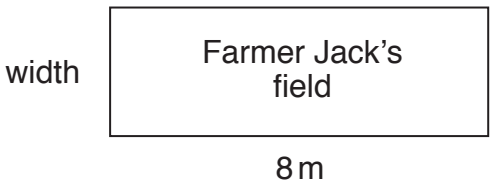
Answer: ..... (1)

Sarah measured the temperature of the beaker again 4 hours and 30 minutes after the last reading on the graph.

(iii) At what time did she take this measurement?

Answer: ..... (1)

20. Farmer Jack and Farmer Giles each have a rectangular field.



not to scale

Farmer Jack's field has an area of 24 m^2.
Its length is 8 m.

(i) Work out the width of Farmer Jack's field.

Answer: ..... m (2)

(ii) Work out the perimeter of Farmer Jack's field.

Answer: ..... m (2)

Farmer Giles' field has a perimeter of 20 m.
The width of Farmer Giles' field is 4 m.

(iii) Work out the length of Farmer Giles' field.

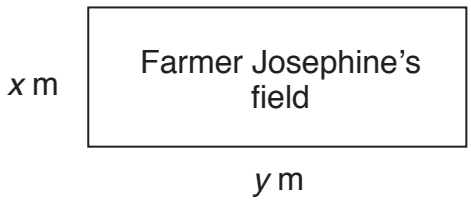
not to scale

Answer: ..... m (2)

(iv) Work out the area of Farmer Giles' field.

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

Farmer Josephine also has a rectangular field.



not to scale

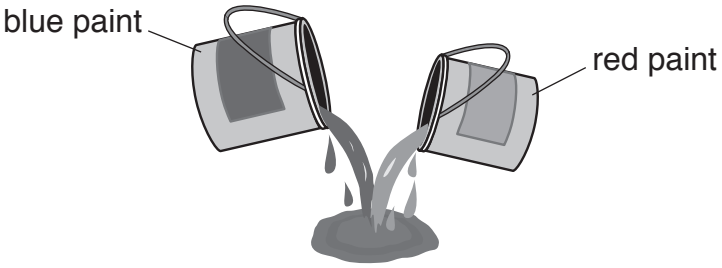
The width of Farmer Josephine's field is x m and the length is y m.
Farmer Josephine builds a fence along the perimeter of her field.

(v) If the total length of this fence is 30 m, write down two possible values of x and y.

Answer: x = ... m and y = ... m

or x = ... m and y = ... m (2)

21. Sanjay is making purple paint.



purple paint

mix 2 litres of red paint for every 3 litres of blue paint

(i) If he uses 6 litres of red paint, how much blue paint should he use?

Answer: ..... litres (1)

(ii) How much blue paint is needed to make 35 litres of purple paint?

Answer: ..... litres (2)

22. (a) Annie and Bradley each think of a number.
The difference between their numbers is 6
The sum of their numbers is 20

What are the two numbers?

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

(b) Alice thinks of a number.
Alice calls her number *a*.
Alice adds 7 to her number, and then doubles her answer.
Write an expression, using *a*, to show what Alice does.

Answer: ..... (2)

(c) Jack thinks of a number.
Jack calls his number *n*.
Jack multiplies his number by 3, and then subtracts 5
He gets the answer 16
Use this information to write down an equation, and then solve it to find *n*.

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

(Total: 100 marks)