SURNAME .... FIRST NAME ....

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

ISEB

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

| ⁻5 | 0 | 5 | 10 | 15 | 20 | 25 |

outside

| ⁻5 | 0 | 5 | 10 | 15 | 20 | 25 |
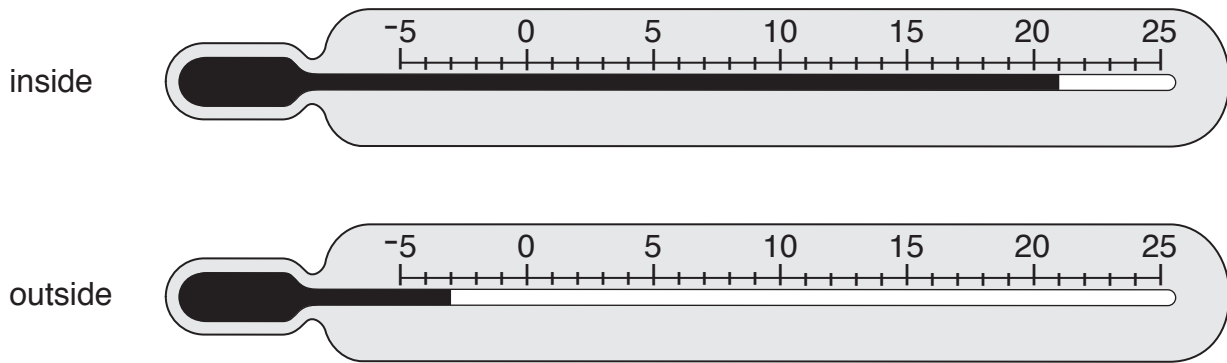
(i) How many degrees warmer was it inside than outside the window?

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) $8 + 4 \times \boxed{} = 36$

(1)

(ii) $5 \times (4 - \boxed{}) = 15$

(1)

(iii) $10 - (5 + \boxed{}) = -3$

(1)

S.A. 28115S**03**   4

6.   Shape **P** is drawn on the centimetre-square grid below.
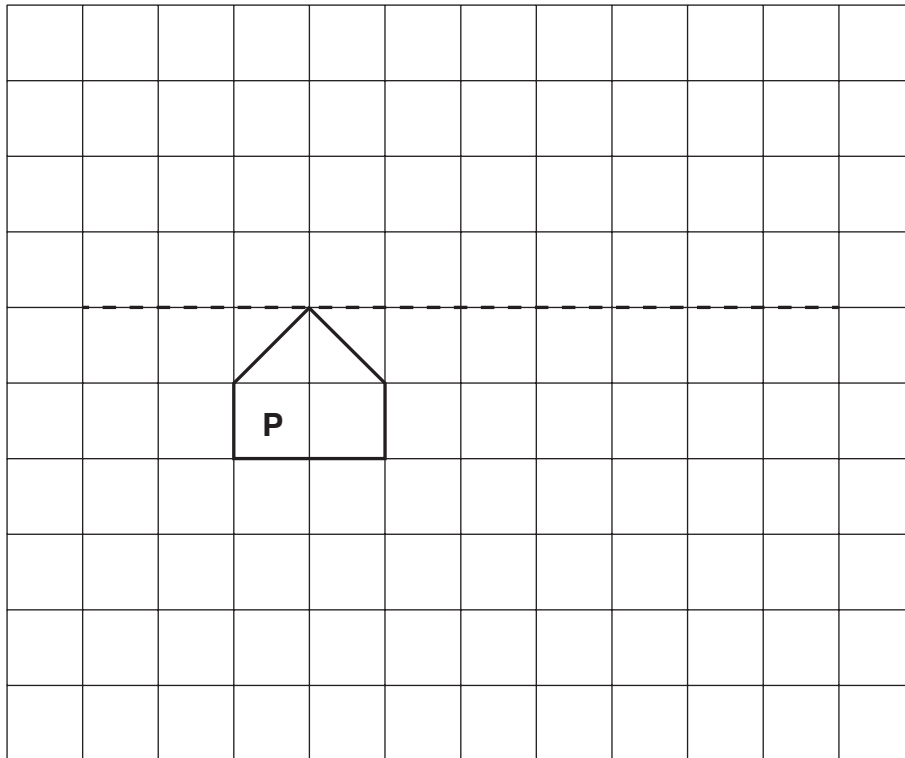
  (i) Reflect shape **P** in the dashed line.

     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:

$$\boxed{6}\ \boxed{3}\ \boxed{7}\ \boxed{5}\ \boxed{9}$$

The cards can be put together to form numbers.

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

$$\boxed{3}\ \boxed{5}\ \boxed{6}\ \boxed{7}$$
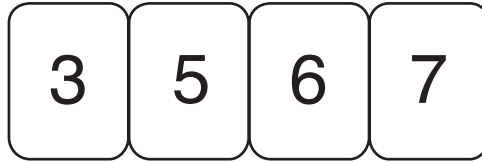
(i) Using all 5 cards

   (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.

$$\boxed{}\boxed{}\ +\ \boxed{}\boxed{}$$
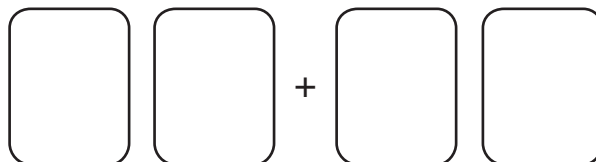
(1)

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.*)

                             ✕──────────────────────
                             A
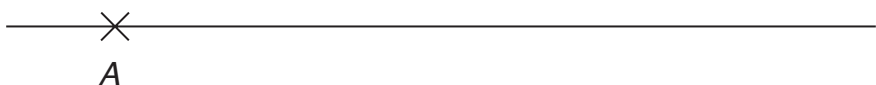
    (3)

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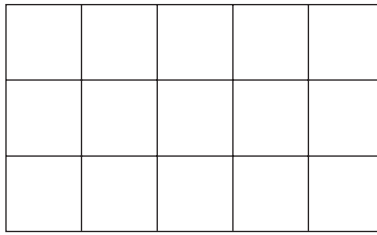
15. (i) Two identical rectangles are divided into 15 equal squares.

    (a) Shade $\frac{3}{5}$ of this rectangle:
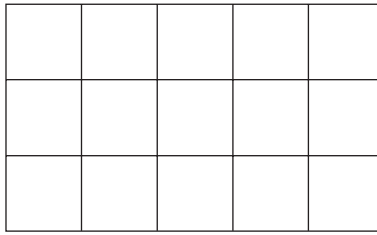
(1)

    (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**.

$$1\frac{1}{3} \qquad \frac{2}{3} \qquad \frac{4}{5} \qquad \frac{13}{15} \qquad \frac{3}{5}$$
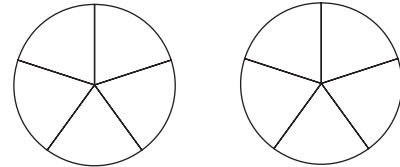
    Answer: ...., ..., ..., ..., ... (2)
             smallest   largest

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.
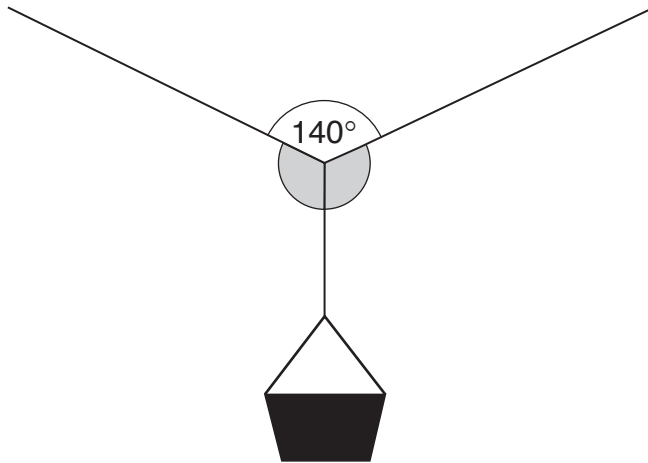 *(You may use the diagrams to help you.)*

 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.

140°

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*.

30°

not to scale

c   *b*

a
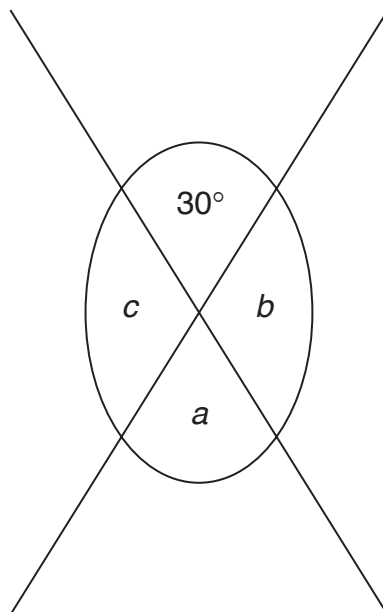
Answer: *a* = ...°

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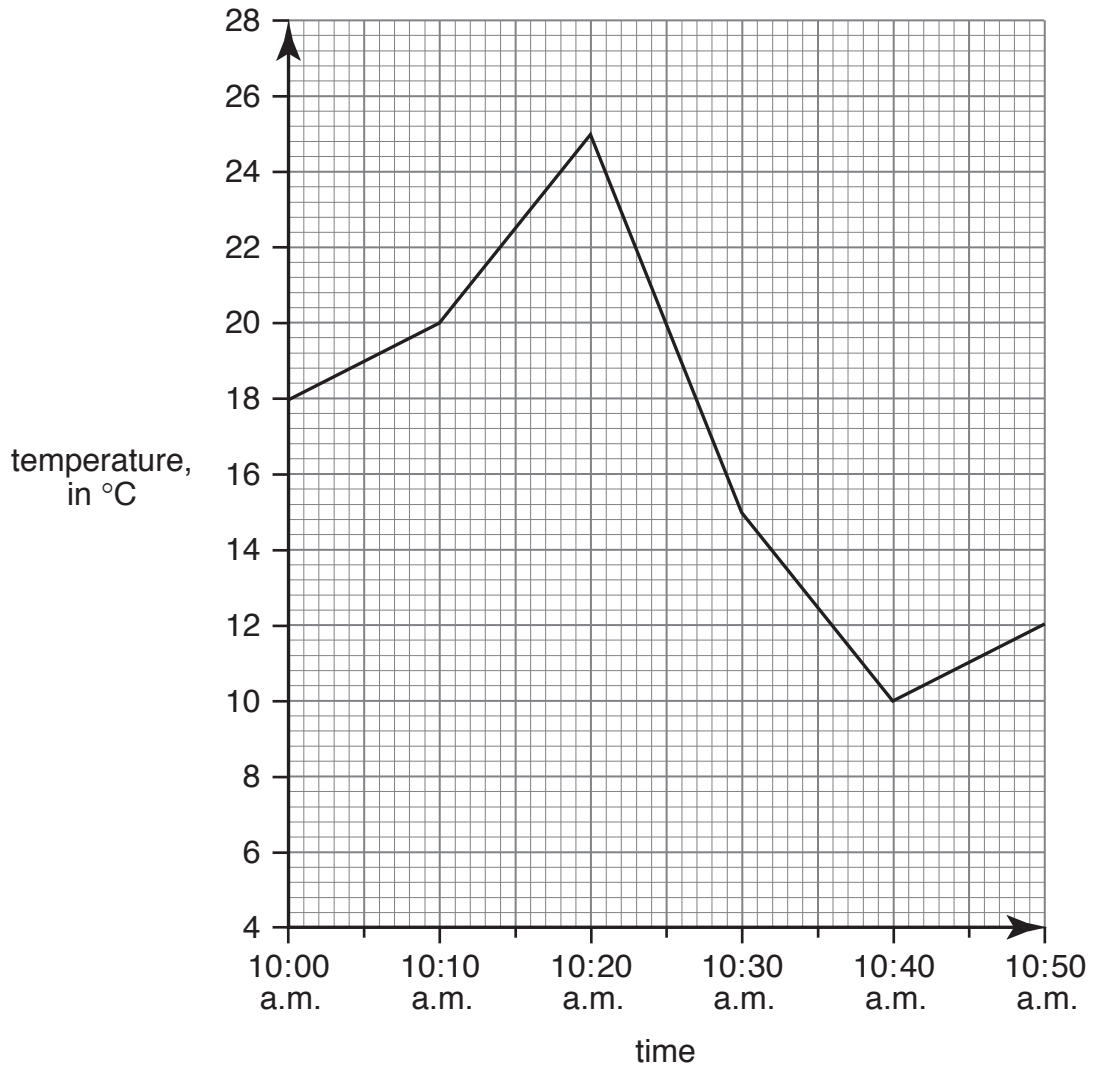
(i) What was the lowest temperature of the beaker?

Answer: .... °C   (1)

(ii) At what time was the temperature of the beaker 15 °C?
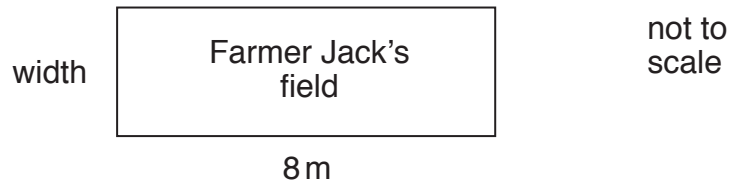
Answer: ....   (1)

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.

width | Farmer Jack's field | not to scale

8 m

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.

4 m | Farmer Giles' field | not to scale

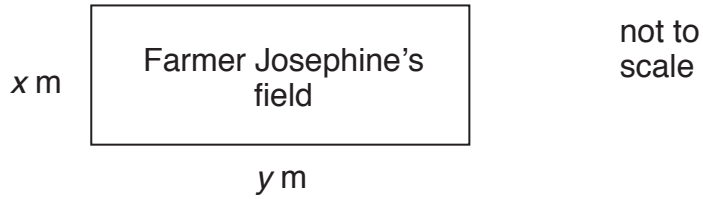 (iii) Work out the length of Farmer Giles' field.

length

Answer: .... m   (2)

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

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

Farmer Josephine also has a rectangular field.

x m

Farmer Josephine's field

y m

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.

blue paint

red 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)