ST ALBANS SCHOOL

11+ Mathematics Examination

Remember that you must **not** use a calculator to answer any question in this examination, but it is very important to show your working as you may get marks for this.

You do not need any geometry equipment.

The maximum marks for each question are shown in brackets. There are 21 pages of questions. The maximum total for this paper is 100 marks.

You have 60 minutes for this paper.

Name …… Date of Birth ……..

Section A Mathematical Skills	Section B Problem Solving	**Total**
30	70	100

SECTION A: MATHEMATICAL SKILLS

1. Write these fractions in size order, starting with the smallest.

$$\frac{5}{8}, \quad \frac{2}{3}, \quad \frac{1}{2}$$

…… …… …… (1)

2. (a) Given that

$$\frac{2}{5}+\frac{3}{7}=\frac{29}{35}$$

write down the answer to

$$\frac{29}{35}-\frac{2}{5}=$$

…… (1)

(b) Given that

$$\frac{2}{3}\times\frac{15}{16}=\frac{5}{8}$$

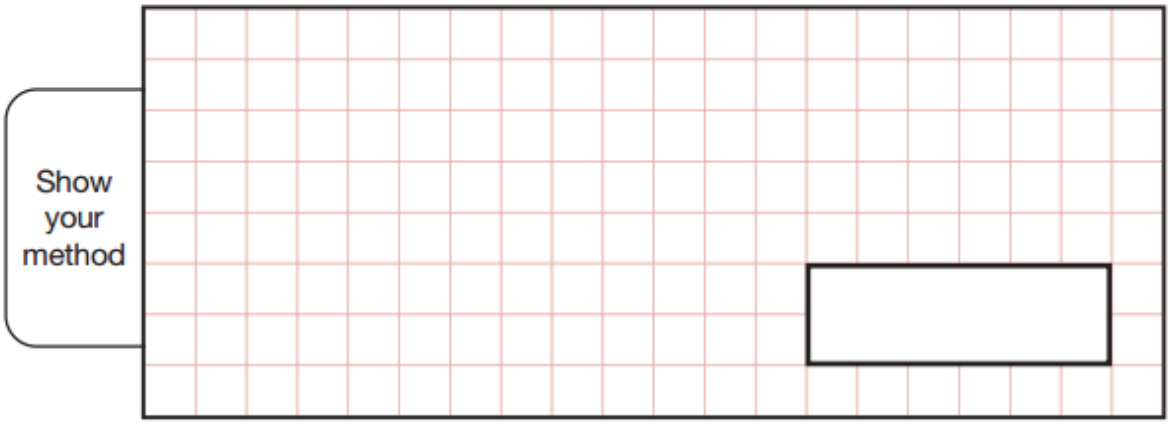
write down the answer to

$$\frac{5}{8}\div\frac{2}{3}=$$

…… (1)

3. (a) Calculate

$$54 \times 64$$



(2)

(b) Use your answer to part (a) to write down the answer to

$$54 \times 32 =$$

…….. (1)

(c) Use your answer to part (a) to write down the answer to

$$5.4 \times 6.4 =$$

…….. (1)

4. Given that

$$574 \times 36 = 20664$$

work out

$$20664 \div 0.36 =$$

…….. (1)

Page Total

5. (a) Write

$$0.505$$

as a fraction in its simplest form.

……. (2)

(b) Write

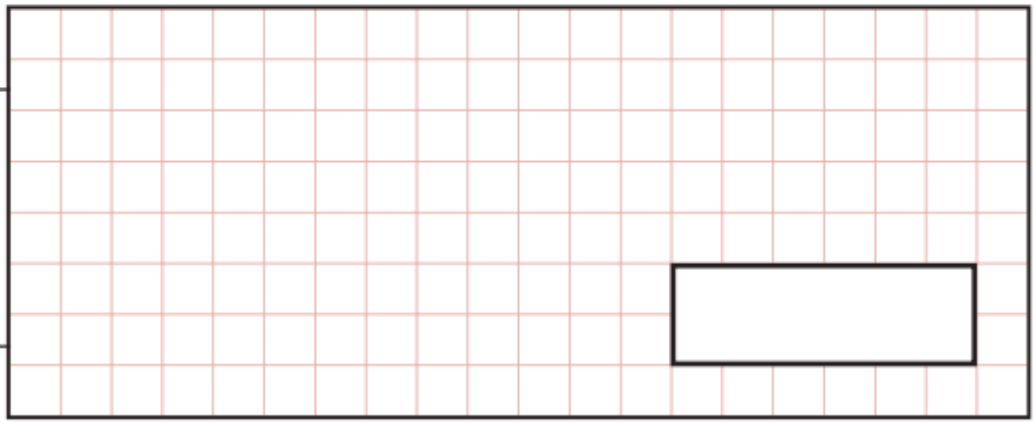
$$\frac{3}{15}$$

as a percentage

……. (2)

6. (a) The distance from St Albans to London is roughly 30 kilometres.
How many centimetres is this?

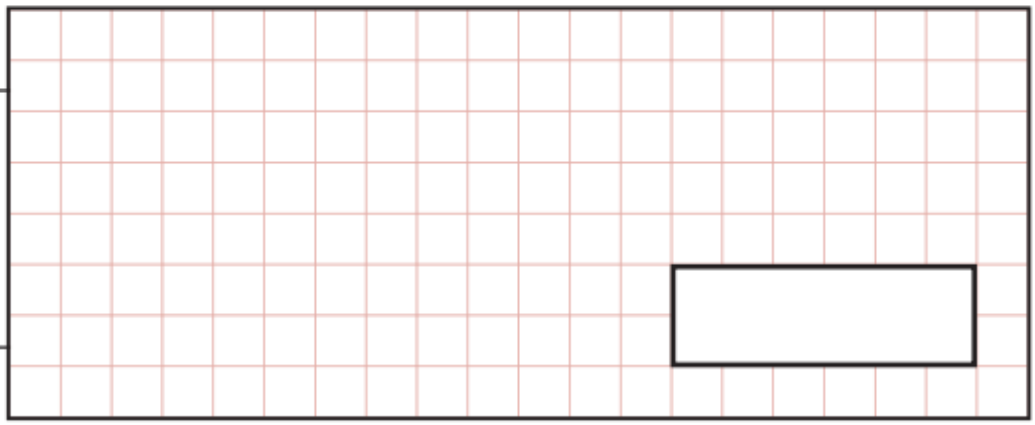
Show your method



(2)

(b) How many times does twenty-seven go into one thousand, four hundred and fifty-eight?

Show your method



(2)

7. Write in words the answer to the square of two thousand and twenty.

..... (2)

8. In this magic square, all the rows, columns and diagonals add up to the same total.
Fill in the missing numbers.

16		6
	0	
		-16

(2)

Page Total

9. Rewrite these calculations, adding brackets where necessary to make each calculation true.

(a) $8 + 8 + 8 \div 2 = 12$

…… (1)

(b) $19 - 34 - 12 = -3$

…… (1)

(c) $7 + 4^2 - 9 + 2 = 110$

…… (1)

10. Work out the answer to the following, giving your answer as a **decimal**.

$$7 + \frac{6}{10} + \frac{11}{25}$$

Show your method

(2)

11. Calculate

$$1.2 + 5.41 - 4.72$$

Show your method

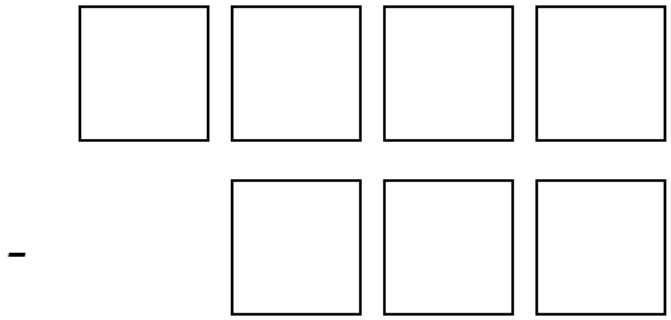
(2)

12. Look at following numbers, each of whch represents a digit in a number problem.

1, 2, 3, 4, 5, 6, 7

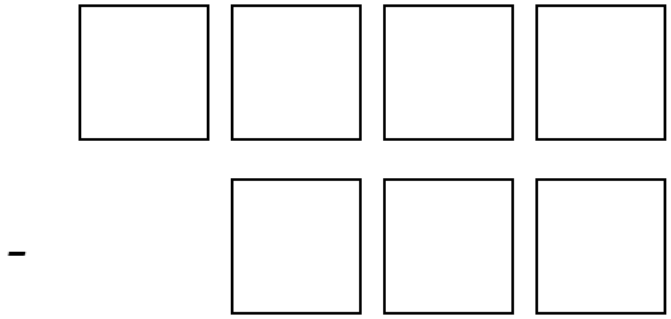
Using each number **once only**:

(a) Enter the numbers into the boxes below in the arrangement that would give the **largest possible answer** when the three digit number is subtracted from the four digit number.



(1)

(b) Enter the numbers into the boxes below in the arrangement that would give the **smallest possible answer** when the three digit number is subtracted from the four digit number.



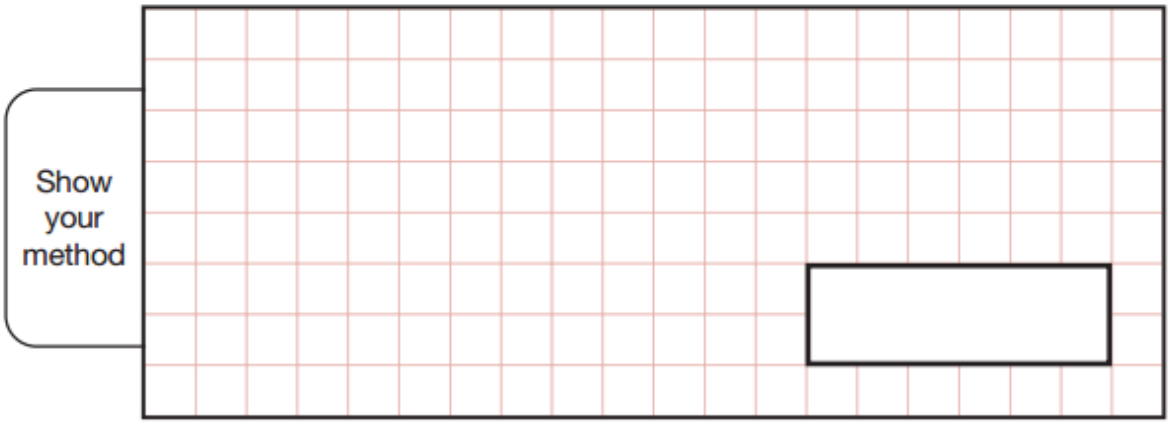
(1)

(c) Write down the **smallest possible answer** to the subtraction from **part (b).**

..... (1)

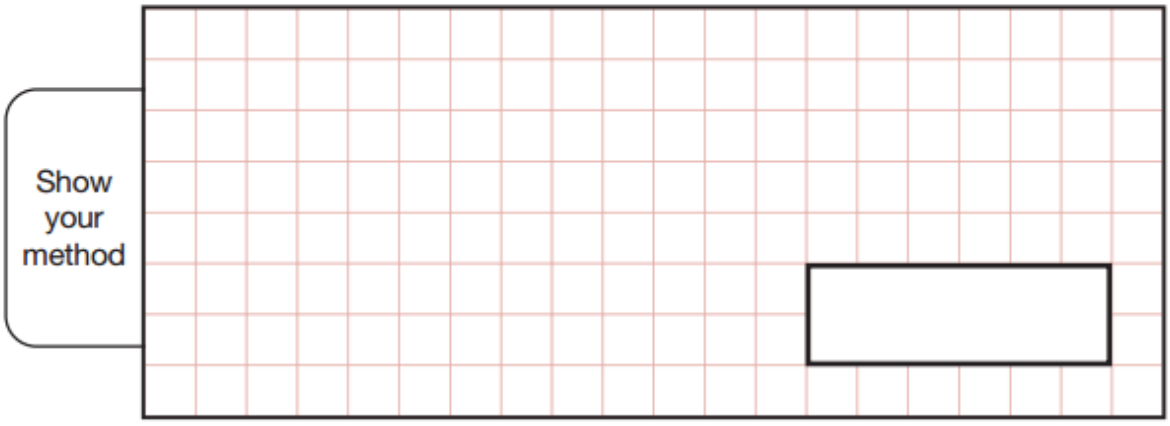
SECTION B: PROBLEM SOLVING

14. (a) The year 2020 is a leap year. Leap years normally occur every fours years. However, years at the turn of a century are leap years only if they are multiples of 400. Therefore the year 2000 was a leap year, but the year 1900 was not. How many leap years will there be between 2021 and 3021?



(3)

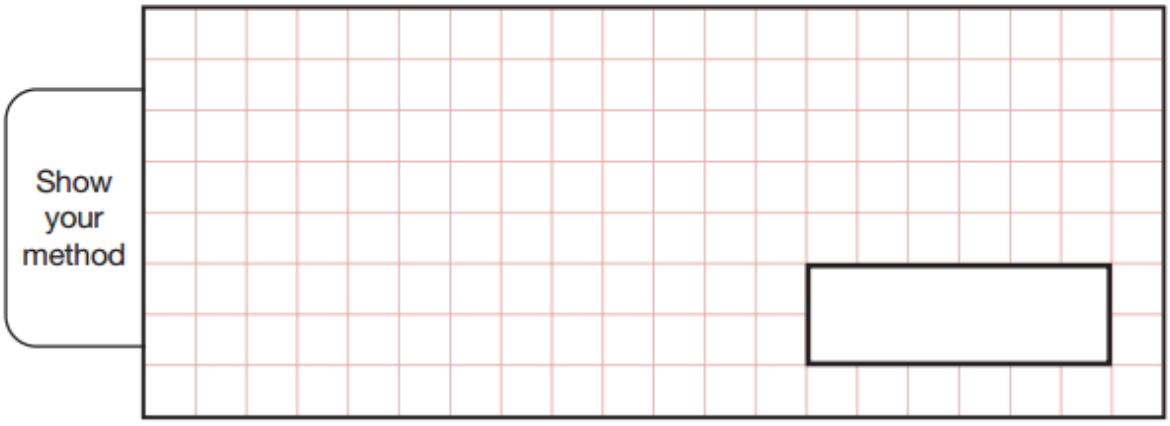
(b) The year 2019 was not leap year; it had 365 days. Which date was precisely in the middle of the year?



(2)

15. Michael took his two children to the zoo. The tickets cost £8.45 for an adult, £6.50 for the elder child and £4.15 for the younger.

How much change did Michael get when he paid with a £20 note?



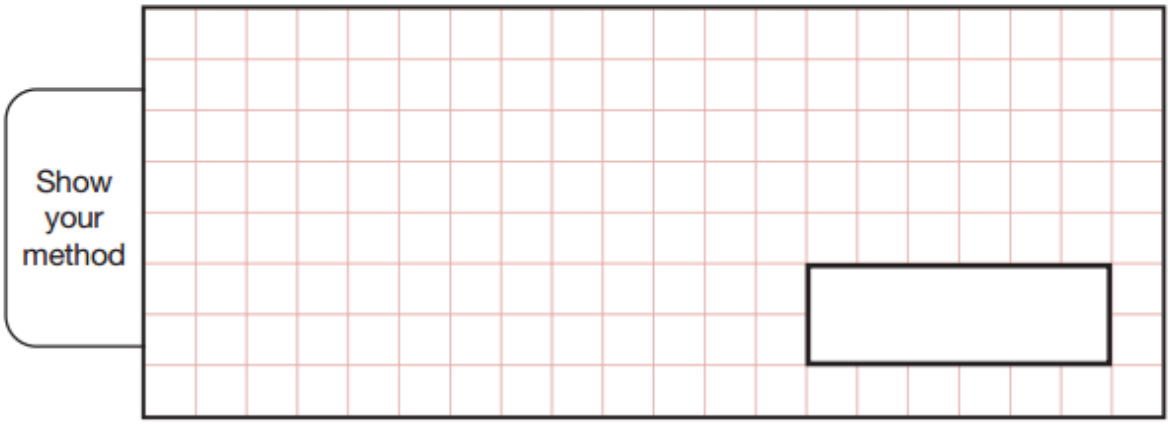
(2)

16. Peter was putting a path down in his garden. He bought 30 paving slabs, each 0.75 m long. He wanted the path to be 21 m long.

Has Peter bought enough paving slabs? (tick one box)

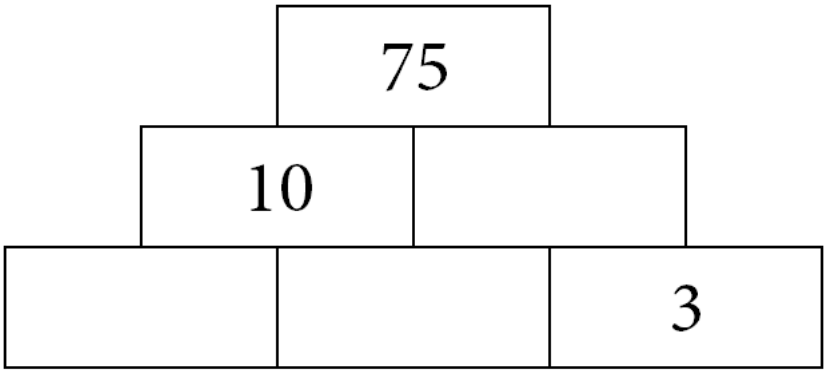
☐ too few ☐ right amount ☐ too many

How many extra or how many too few has Peter bought?



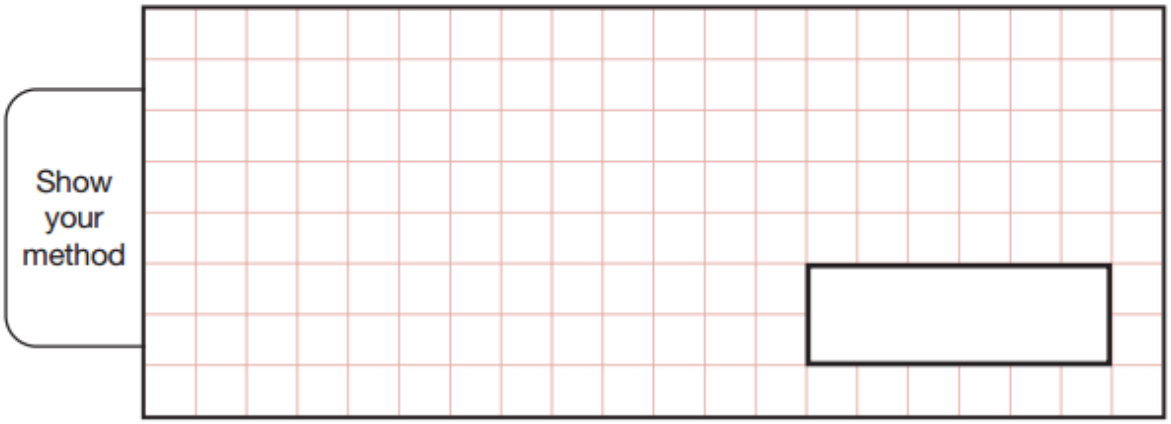
(3)

17. In this number wall, two numbers are **multiplied** to give the number above.
Work out the missing numbers to make the wall correct.



(3)

18. A shop sells t-shirts for £10.55 each and jumpers for £16.40 each.
One week the shop sells twice as many t-shirts as jumpers and receives £9000.
How many of each did the shop sell?



(4)

19. Each of these square roots lies between two consecutive whole numbers.
Work out what the two whole numbers are in each case.

(a) $\sqrt{190}$

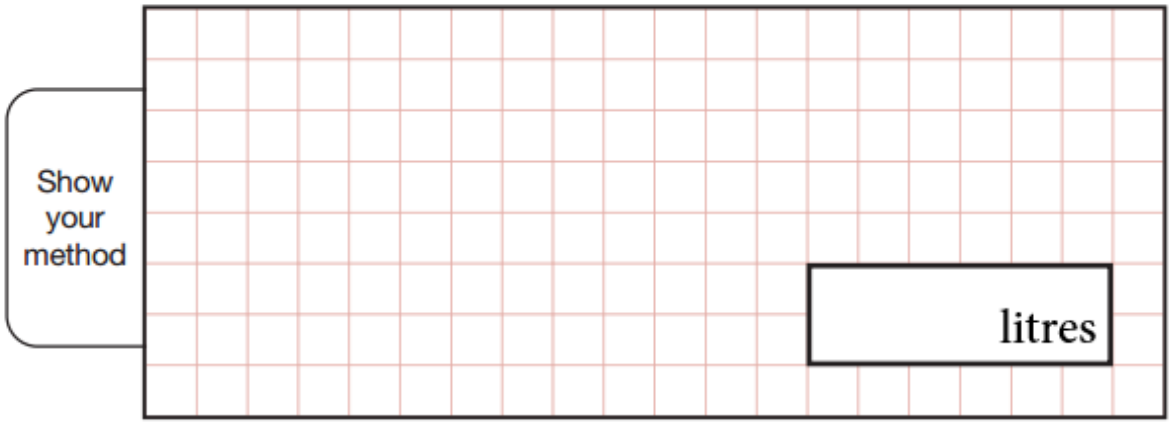
lies between …… and …….. (2)

(b) $\sqrt{2020}$

lies between …… and …….. (2)

Page Total

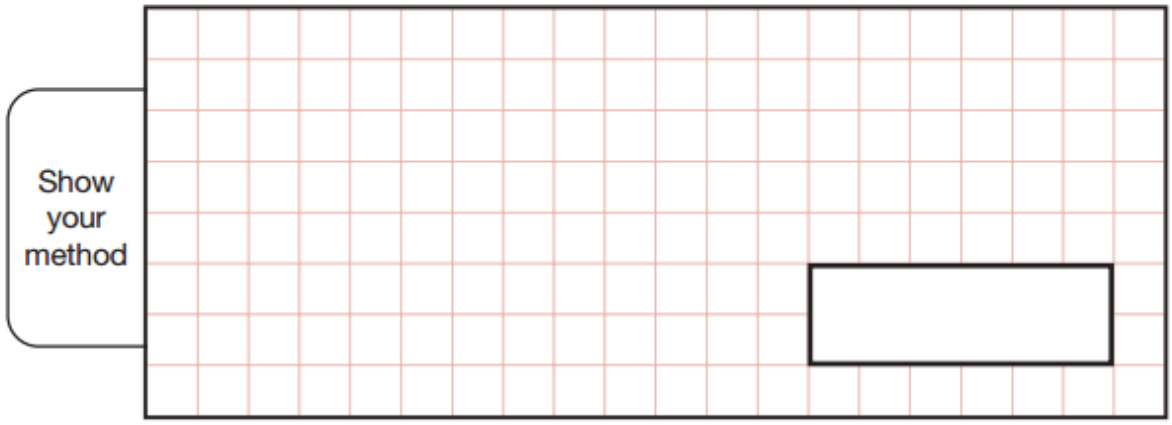
20. Gerwyn has to take 5 ml of medicine four times a day. He must take this for 60 days.
How many litres of the medicine should he be given?



(3)

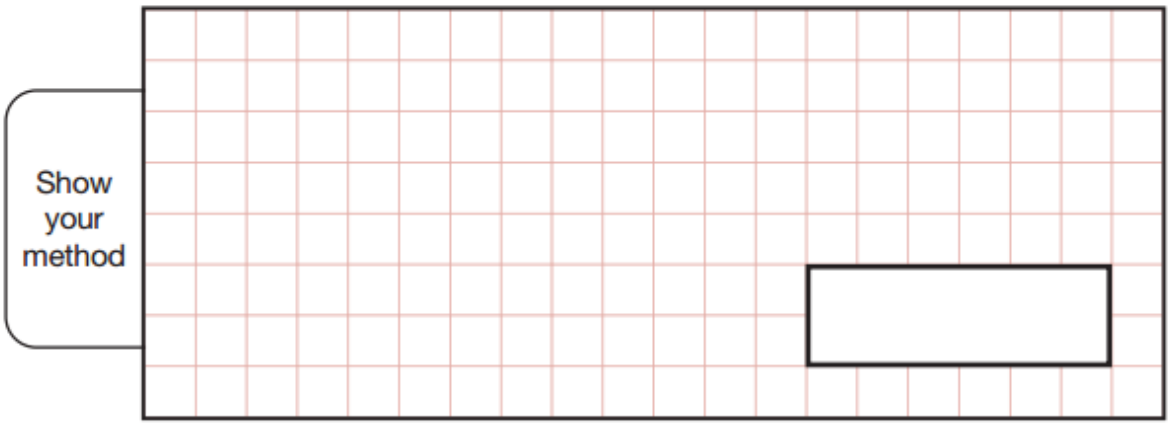
21. Glen was asked to make a rectangle with a piece of wire of length 18 cm.
He was told to make the length and the width whole numbers of centimetres.

(a) Find the **smallest** area of the rectangle he could make with that length of wire.



(2)

(b) Find the **largest** area of the rectangle he could make with that length of wire.

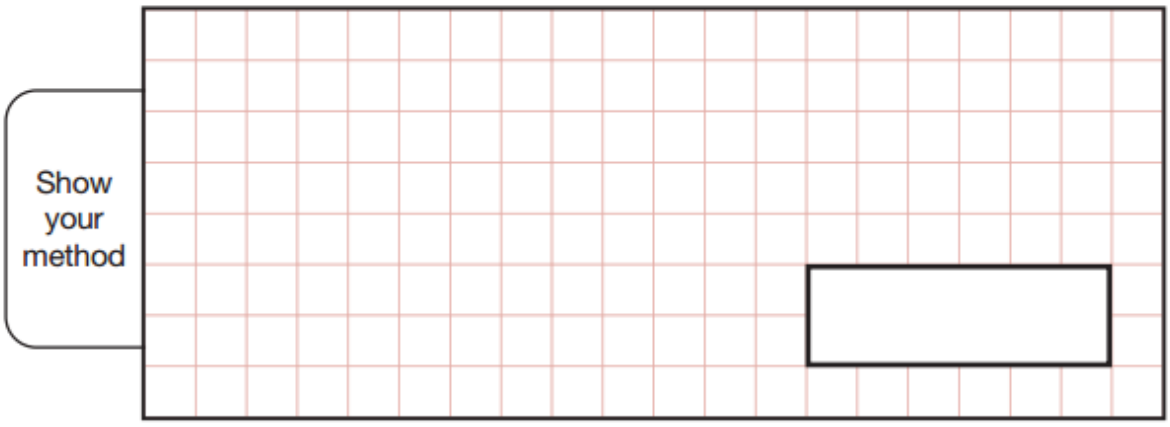


(2)

22. There are 23 fractions in the following sequence:

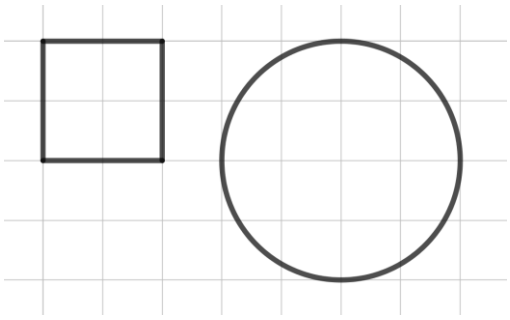
$$\frac{1}{24}, \frac{2}{24}, \frac{3}{24}, \frac{4}{24}, \ldots, \frac{23}{24}$$

How many of them **cannot** be simplified?



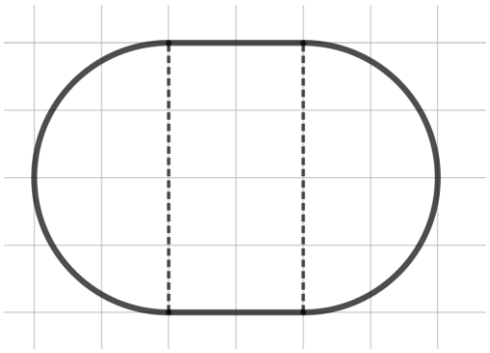
(2)

23. The perimeter of the square is p cm and the perimeter of the circle is q cm.



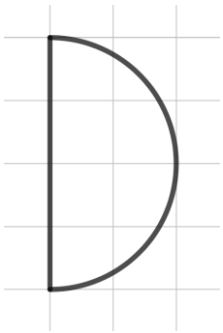
Work out an expression for the perimeter of each of these shapes.

(a)



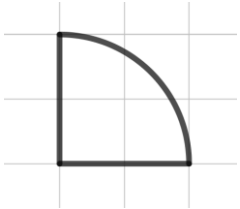
..... (2)

(b)



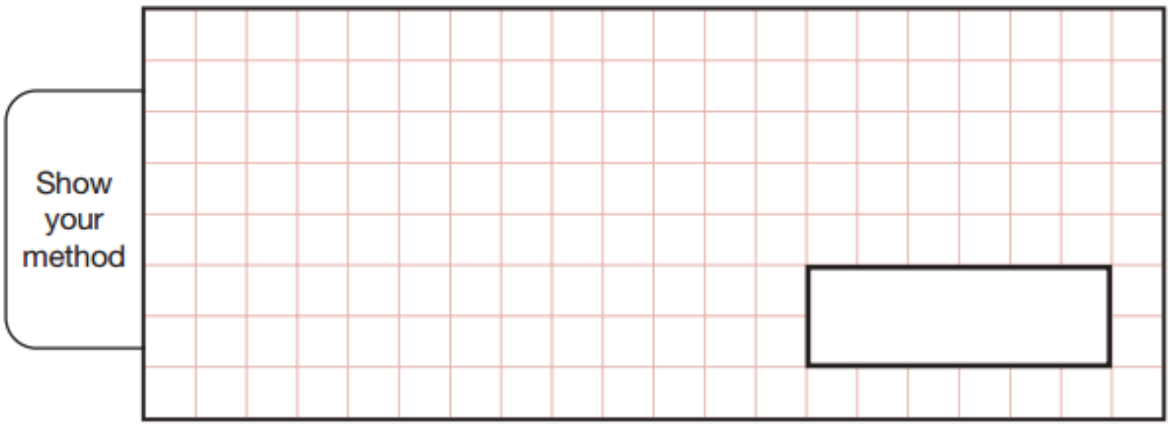
..... (2)

(c)



..... (2)

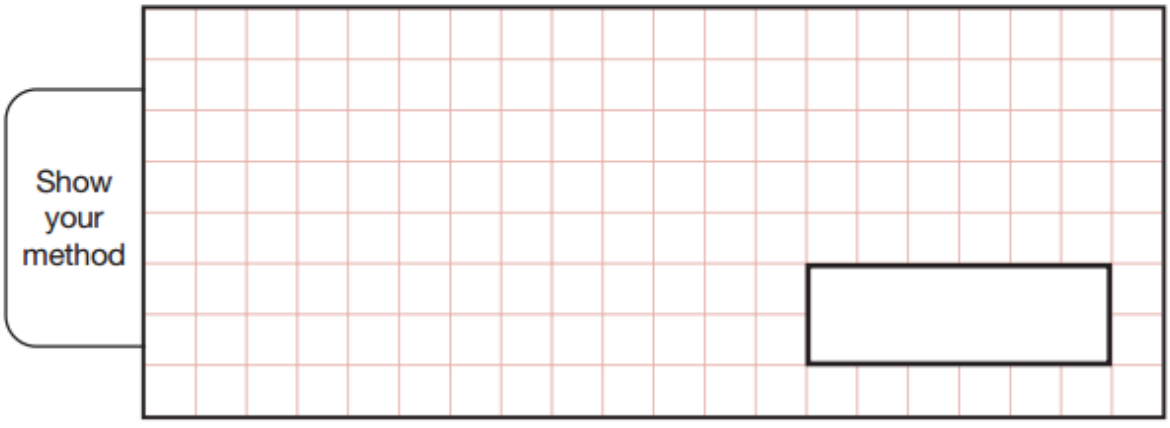
24. Nathan has £600.
He gives 25% to charity. He spends two thirds of it. He saves half of the rest.
How much does he save?



(3)

25. Write down a fraction with a value between

$$\frac{13}{6} \text{ and } \frac{13}{5}$$



(3)

26. Here is a common type of number puzzle.

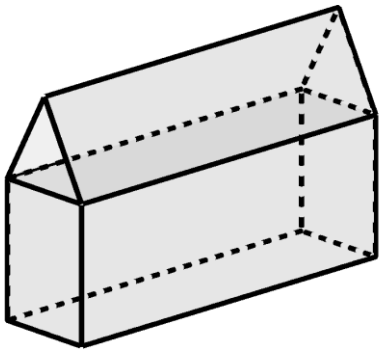
Each letter stands for a different number. The row and column totals are given.

Find the value of each letter.

A	B	C	A	22
B	C	D	A	23
C	C	C	C	20
D	B	A	D	26
23	16	25	27	

A = B = C = D = (4)

27. This 3D object is made by putting together a cuboid and a triangular prism.



How many faces, edges and vertices does the object have?

faces ……. edges ……. vertices ……. (3)

28. What number is halfway between

$$1\frac{2}{3} \text{ and } 2\frac{1}{5}$$

Show your method

(3)

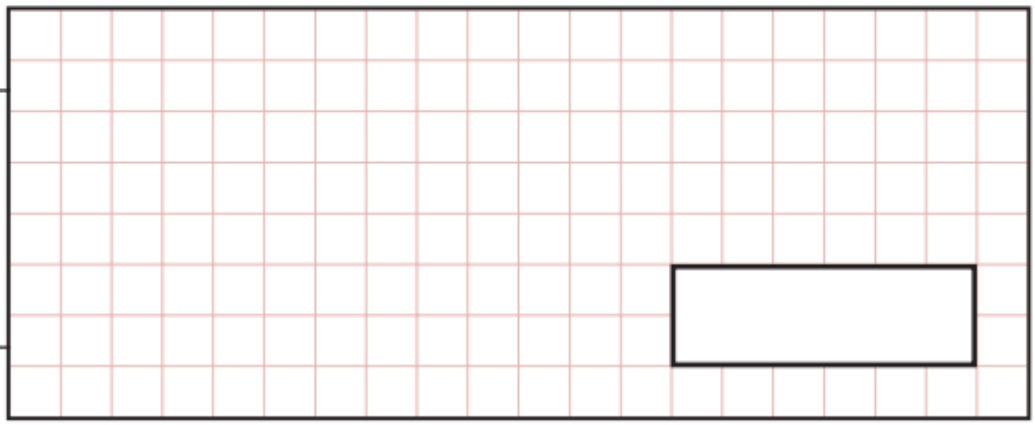
Page Total

29. The width of a rectangle is w cm.

The length is 3 cm more than the width.

(a) Write down a formula for the area, a cm^2, in terms of w.

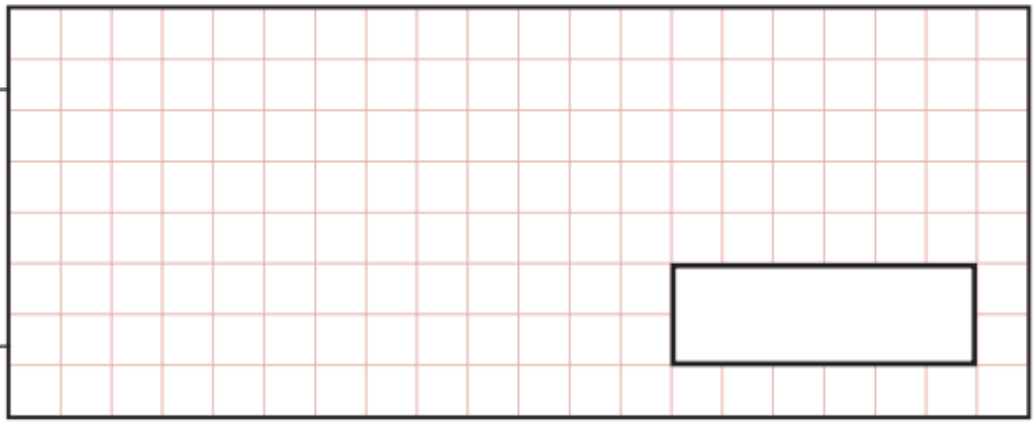
Show your method



(2)

(b) Write down a formula for the perimeter, p cm, in terms of w.

Show your method



(2)

30. This shape is made from four **identical** rectangles.

Diagram not to scale

Work out the area of the shape.

Show your method

(3)

31. Eight lamp posts are in a straight line. The distance from each post to the next is 25 m.
What is the distance from the first post to the last?

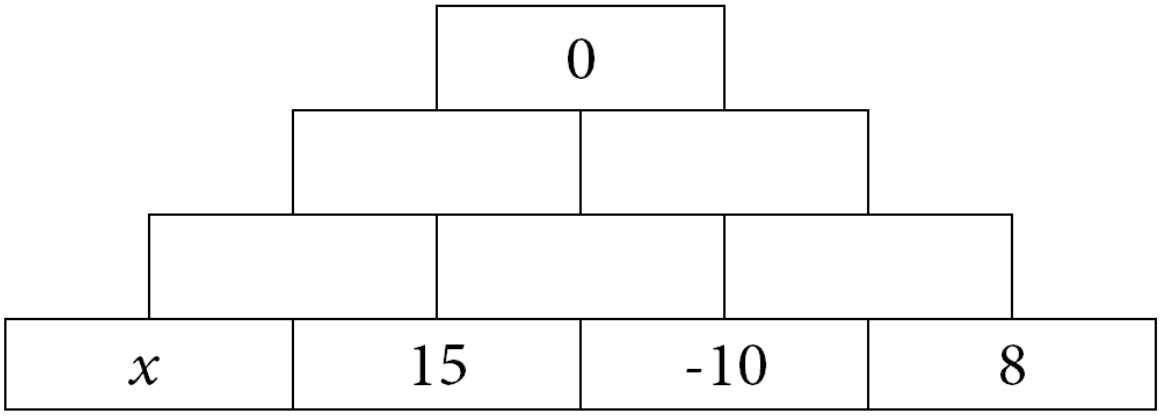
Show your method

(2)

Page Total

32. In this number wall, two numbers are **added** to give the number above.

Work out the value of x in this number wall.



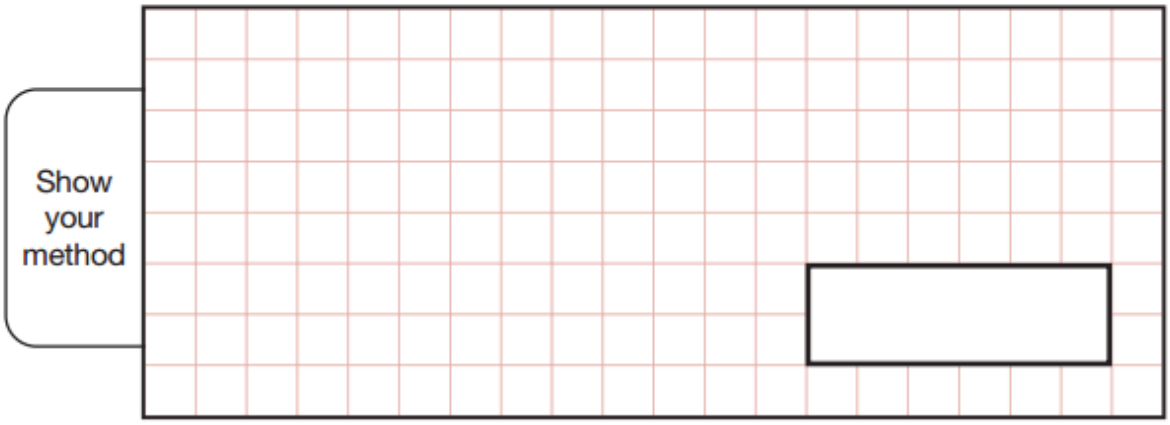
Use the space below if you need room for your workings.

Show your method

(4)

33. On four tests, each marked out of 100, Dimitri's mean average was 85.

What is the lowest mark Dimitri could have scored on any one test?



(2)

34 Put any **necessary** brackets into the calculation below to make it correct.

$$10 \times 9 \times 8 + 7 + 6 \times 5 \times 4 \times 3 + 2 \times 1 = 2020$$

(3)

This is the end of the Examination.

Page Total

Spare page

Spare Page

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