

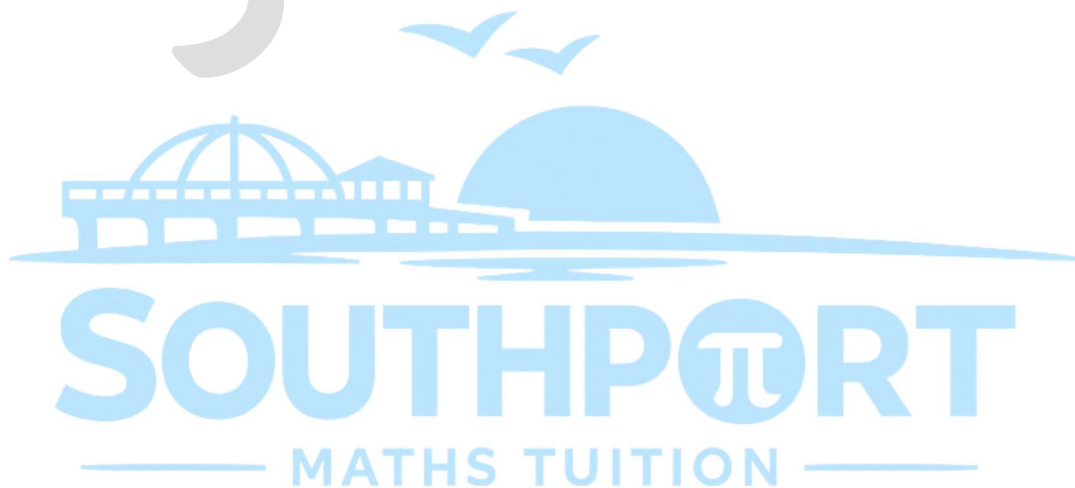
GCSE MATHEMATICS

Fluency

REVISION BOOKLET

Name: _____

SAMPLE



Contents

Number and proportion

• Fraction calculations	3	• Proportion problems	10
• FDP conversions	5	• Direct proportion	13
• Percentage increase / decrease	6	• Best buys	15
• Reverse percentages	7	• Standard form	16
• Ratio (sharing / combining)	8	• Index Laws	17

Algebra

• Forming expressions	18	• Expanding double brackets	24
• Substitution	19	• Factorising quadratics	25
• Collecting like terms	20	• Linear sequences	26
• Solving equations	21	• Linear graphs	28
• Single Brackets	23	• Simultaneous equations	32

Accuracy

• Rounding	34	• Bounds	36
• Estimating	35		

Geometry and measure

• Angles in parallels	38	• Scale diagrams	52
• Angles in polygons	40	• Bearings	54
• Perimeter and area	42	• Constructions and loci	56
• Circles	47	• Units	60
• Pythagoras	48	• Volume of cuboids / prisms	63
• SOHCAHTOA	50		

Transformations

• Translations	66	• Rotations	73
• Reflections	69	• Enlargements	76

Statistics and probability

• Averages from tables	80	• Scatter-graphs	92
• Two-way tables	82	• Stem-and-leaf diagrams	96
• Box plots	84	• Probability	98
• Cumulative frequency	88	• Frequency trees	100

FDP Conversions – What you need to know

- $1/2 = 0.5 = 50\%$
- $1/4 = 0.25 = 25\%$
- $3/4 = 0.75 = 75\%$
- $1/5 = 0.2 = 20\%$
- $1/10 = 0.1 = 10\%$
- Convert **fractions to decimals** by dividing the numerator by the denominator.
- Convert **fractions to percentages** by making the denominator 100 or multiplying the decimal by 100.
- Convert **decimals to fractions** by writing the digits over the correct power of 10 and simplifying.
- Convert **decimals to percentages** by multiplying by 100.
- Convert **percentages to decimals** by dividing by 100.
- Convert **percentages to fractions** by writing the percentage over 100 and simplifying.
- Compare FDP values by converting **all to the same form** (usually decimals).

1. Write 0.36 as a fraction in its simplest form. 1 mark
2. Write $5/8$ as a decimal. 1 mark
3. Write 0.4 as a percentage. 1 mark
4. Write 72% as a decimal. 1 mark
5. Write 0.18 as a fraction in its simplest form. 1 mark
6. Write $3/20$ as a percentage. 1 mark
7. Write in ascending order:
0.32 $3/10$ 35% 2 marks
8. Put these values in ascending order:
0.7 $3/4$ 73% 0.68 2 marks
9. Put these numbers in ascending order:
12% 0.15 $1/8$ 0.09 2 marks
10. A student gets 18 out of 25 on a test.
Write this as a percentage. 1 mark

Simultaneous equations – What you need to know:

- A solution is the **pair of values** that makes **both equations true**.
- Use **elimination** when you can make one variable cancel.
- Keep equations **lined up** (x under x , y under y).
- You can **multiply** both sides of an equation to change the coefficients on your variables.
- **Add or subtract** equations to eliminate a variable.
- After finding one value, **substitute** it into either equation to find the other.
- Always **check** your answers in both equations.

1. Solve the simultaneous equations

$$\begin{aligned}x + y &= 12 \\x - y &= 4\end{aligned}$$

2 marks

2. Solve the simultaneous equations

$$\begin{aligned}2x + y &= 11 \\x + y &= 8\end{aligned}$$

2 marks

3. Solve the simultaneous equations

$$\begin{aligned}3x + y &= 16 \\x + y &= 10\end{aligned}$$

2 marks

4. Solve the simultaneous equations

$$\begin{aligned}4x - y &= 7 \\2x - y &= 3\end{aligned}$$

2 marks

5. Solve the simultaneous equations

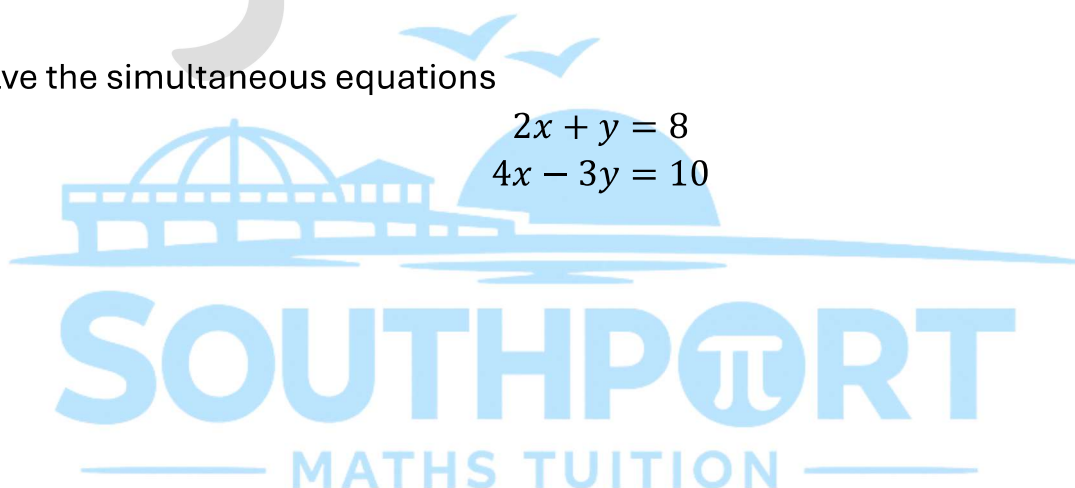
$$\begin{aligned}3x + 2y &= 19 \\5x - 4y &= 7\end{aligned}$$

3 marks

6. Solve the simultaneous equations

$$\begin{aligned}2x + y &= 8 \\4x - 3y &= 10\end{aligned}$$

3 marks



Volume of cuboids / prisms – What you need to know:

- **Volume of a cuboid** is length \times width \times height.
- **Volume of a prism** is *area of cross-section* \times *length*.
- The **cross-section** is the face that is the same shape all the way through.
- Use correct **units**:
 - Dimensions in cm \rightarrow volume in cm^3
 - Dimensions in m \rightarrow volume in m^3
- Convert units **before** calculating if needed (e.g., 1 m = 100 cm).
- For complicated solids, **split into simpler solids**, find each volume, then add.
- For missing lengths, **rearrange**:

$$\text{length} = \frac{\text{volume}}{\text{area of cross-section}}$$

1. A cuboid has dimensions 8 cm, 5 cm and 12 cm.
Work out its volume.

1 mark

2. A triangular prism has a triangular cross-section with base 6 cm and height 4 cm.
The length of the prism is 10 cm.
Work out its volume.

2 marks

3. A water tank is a cuboid of volume $54\,000\text{ cm}^3$.
Its base measures 45 cm by 20 cm.
Work out the height of the tank.

2 marks

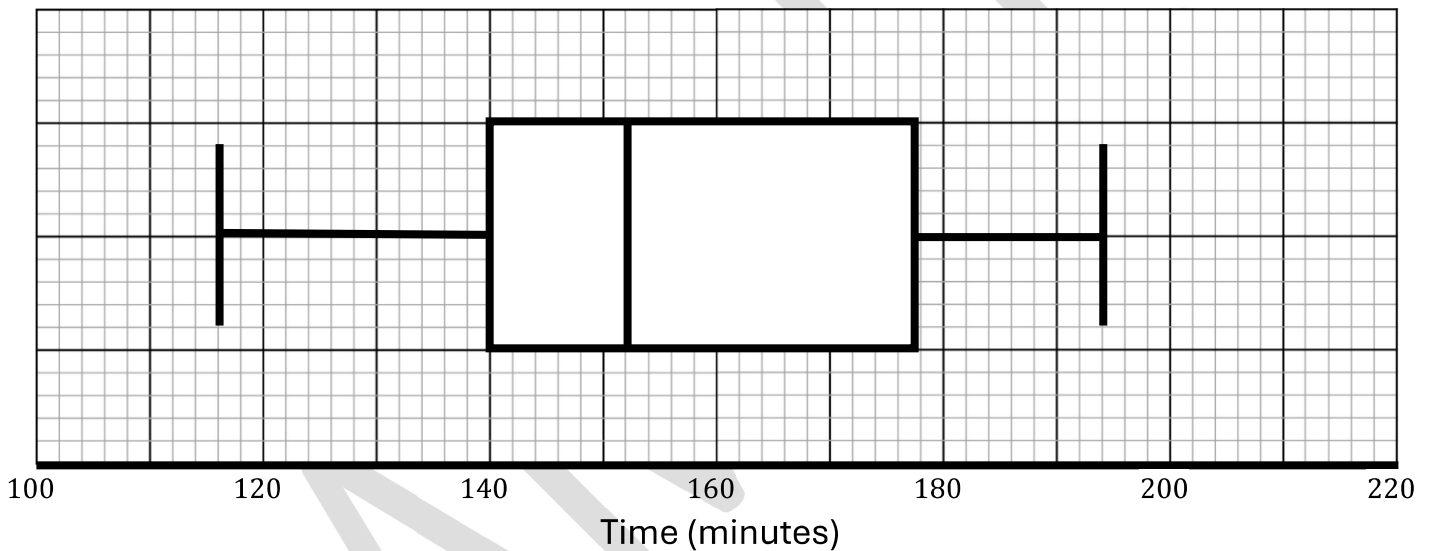
4. A prism has a cross-sectional area of 32 cm^2 and a length of 1.5 m.
Work out the volume in cm^3 .

3 marks

Box plots – What you need to know:

- A **box plot** shows how a set of data is **spread out**.
- The **median** is the middle value
- The **lower quartile (Q1)** is the value 25% of the way through the data.
- The **upper quartile (Q3)** is the value 75% of the way through the data.
- The **interquartile range (IQR)** is the spread of the middle 50% of the data
 - $IQR = Q3 - Q1$
- The whiskers show the lowest and highest values in the data set.
- To compare two box plots, look for differences in:
 - Median (typical value)
 - IQR (spread of the middle 50%)
 - Range (overall spread)

1. The box plot shows the times (in minutes) of how long some pupils spend watching TV.



a. What is the median amount of time watching TV?

1 mark

b. Calculate the IQR of the data?

2 marks

c. Identify the maximum amount of time?

1 mark

