

Grade E PROMPT sheet

E1 Multiply & divide by 10, 100, 1000

- **By moving the decimal point**

To **multiply** by 10 move the dp ONE place RIGHT

e.g. $3.4 \times 10 = 34$

To **divide** by 10 move the dp ONE place LEFT

e.g. $3.4 \div 10 = 0.34$

- **By moving the digits**

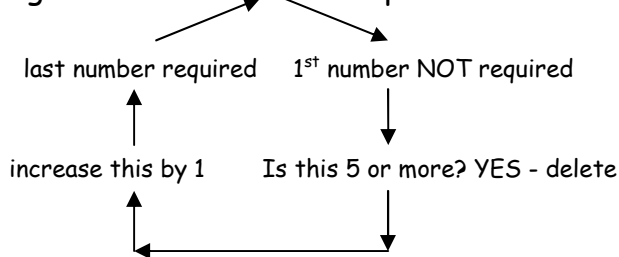
To multiply by 10 move the dp ONE place RIGHT

e.g. $3.52 \times 10 = 35.2$

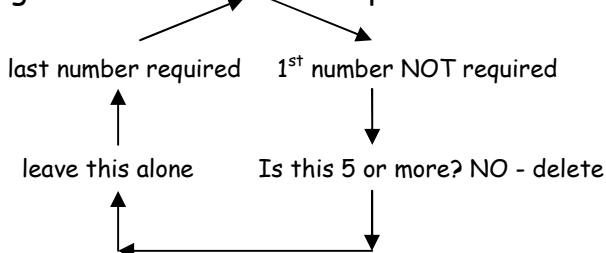
E2 Rounding decimals

- Look at the last number required
- Look at the first number NOT required

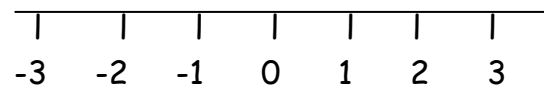
e.g. To round 5.47 to 1dp



e.g. To round 5.43 to 1dp



E2 Order negative numbers



$2 > -2$ → We say 2 is bigger than -2

$-1 < 3$ → We say -1 is less than 3

E3 Number patterns

Look to see how numbers are connected

- **Multiples**

Multiples of 6 are: 6, 12, 18, 24, 30...

- **Factors**

Factors of 6 are: 1, 6, 3, 2

- **Prime numbers**

Prime numbers have only TWO factors

2, 3, 5, 7, 11, 13, 17, 29, 31, 37

- **Sequences**

1, 4, 9, 16, 25, 36 ... are all square numbers

1, 8, 27, 64, 125 ... are all cube numbers

1, 4, 7, 10, 13, 16 ... increase by 3 each time

E4 Order fractions and decimals

- **Fractions**

They must have the same denominator

e.g. $\frac{5}{6}, \frac{7}{12}, \frac{2}{3}, \frac{3}{4}$

↓ ↓ ↓ ↓

$\frac{10}{12}, \frac{7}{12}, \frac{9}{12}, \frac{8}{12}$

Now the fractions can be ordered

- **Decimals**

Give them all the same number of digits

e.g. 0.3, 0.304, 0.32, 0.33

↓ ↓ ↓ ↓

0.300 0.304 0.320 0.330

Now the decimals can be ordered

E5 Cancel a fraction to its lowest terms

See what number divides exactly into both the numerator and denominator

$$\text{e.g. } \frac{8}{12} \xrightarrow{\div 4} \frac{2}{3}$$

$$\text{e.g. } \frac{15}{40} \xrightarrow{\div 5} \frac{3}{8}$$

E6 Order of operations

Bracket

Indices

Divide

Multiply

Add

Subtract

} Do these in the order they appear
 } Do these in the order they appear

$$\text{e.g. } 3 + 4 \times 6 - 5 = 22$$

↑
first

E7 Fraction of quantity with calculator

- $\frac{4}{5}$ means $\div 5 \times 4$

e.g. To find $\frac{4}{5}$ of £40

$$\text{£}40 \div 5 \times 4 = \text{£}40$$

E7 Percentage of quantity with calculator

- **Change the percentage to a decimal**

| | |
|---------------------|----------------------------|
| e.g. 8% of £240 | 12 $\frac{1}{2}$ % of 80kg |
| = 0.08×240 | = 0.125×80 |
| = <u>£19.20</u> | = <u>10kg</u> |

$$\begin{aligned} &80\% \text{ of } 52 \text{ litres} \\ &= 0.8 \times 52 \\ &= \underline{41.6 \text{ litres}} \end{aligned}$$

E8 Multiply by a two digit number

Try different methods to find which suits you

e.g. 152×34

COLUMN METHOD

$$\begin{array}{r} 152 \\ \times 34 \\ \hline 608 \quad (\times 4) \\ 4560 \quad (\times 30) \\ \hline \underline{5168} \end{array}$$

e.g. 152×34

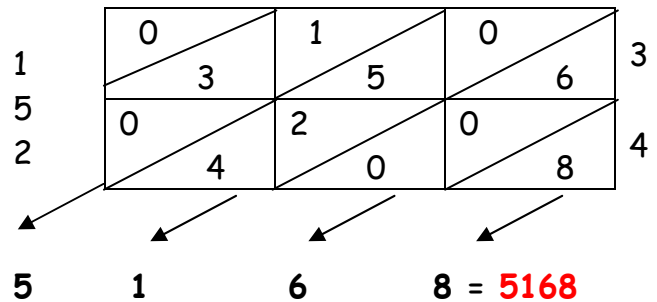
GRID METHOD

| | | | |
|----|-------------|-------------|-----------|
| | 100 | 50 | 2 |
| 30 | 3000 | 1500 | 60 |
| 4 | 400 | 200 | 8 |

$$152 \times 34 = 3400 + 1700 + 68 = \underline{5168}$$

e.g. 152×34

CHINESE METHOD



e.g. 152×34

RUSSIAN METHOD

| | |
|--------------------------------|-----------------|
| Half | Double |
| ↓ | ↓ |
| 152 × 34 | |
| 76 | 68 |
| 38 | 136 |
| 19 | 272 |
| 9 | 544 |
| 4 | 1088 |
| 2 | 2176 |
| 1 | 4352 |

Cross out
left hand
side even
numbers

Add what is left
 $272 + 544 + 4352 = \underline{5168}$

E8 Divide by a two digit number

Try different methods to find which suits you

e.g. $4928 \div 32$ BUS SHELTER METHOD

- Divide
- Multiply
- Subtract
- Bring down - Make a new number
- Divide ...

$$\begin{array}{r} 0154 \\ 32 \overline{) 4928} \\ \underline{-32} \\ 172 \\ \underline{-160} \\ 128 \\ \underline{-128} \\ 000 \end{array}$$

$$4928 \div 32 = \underline{154}$$

e.g. $4928 \div 32$ CHUNKING METHOD

$$\begin{array}{r} 4928 \\ \underline{3200} \quad 100 \times 32 \\ 1728 \\ \underline{1600} \quad 50 \times 32 \\ 128 \\ \underline{128} \quad 4 \times 32 \\ 0 \end{array}$$

$$4928 \div 32 = \underline{154}$$

e.g. $4928 \div 32$ SHORT DIVISION METHOD

(Except write down some of your tables down first)

$$\begin{array}{r} 32 \\ 64 \\ 96 \\ 128 \\ 160 \end{array} \quad \begin{array}{r} 0154 \\ 32 \overline{) 4^4 9^{17} 2^{12} 8} \end{array}$$

$$4928 \div 32 = \underline{154}$$

E9 Negative numbers

Remember the rules:

- When subtracting go down the number line
- When adding go up the number line

- $8 + - 2$ is the same as $8 - 2 = 6$
- $8 - + 2$ is the same as $8 - 2 = 6$
- $8 - - 2$ is the same as $8 + 2 = 10$

E10 Ratio

- How it is written



$$\begin{array}{l} \text{Yellow : Red} \\ = 2 : 6 \end{array}$$

- How it can be simplified



$$\begin{array}{l} \text{Yellow : Red} \\ = 1 : 3 \end{array}$$

- Simplify by cancelling

Examples

$$2^{-2} : 6^{-2} = 1 : 3$$

$$10^{-5} : 15^{-5} = 2 : 3$$

E10 Direct proportion

e.g. 1

5 miles is approximately 8km.

How many miles are equal to 24km?

$$24\text{km} \div 8\text{km} = 3$$

$$5 \text{ miles} \times 3 = 15 \text{ miles}$$

e.g. 2

It takes 90 Lego bricks to build 3 planes



How many bricks would be needed for 11?

$$1 \text{ plane uses } 90 \div 3 = 30 \text{ bricks}$$

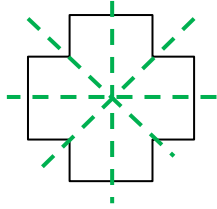
$$11 \text{ planes will use } 11 \times 30 = 330 \text{ bricks}$$

E12&13 Properties of 2D & 3D shapes

Symmetries

- Order of Line Symmetry**

this is the number of times a shape can be folded so that one side falls exactly onto the other side



This shape has line symmetry ORDER 4

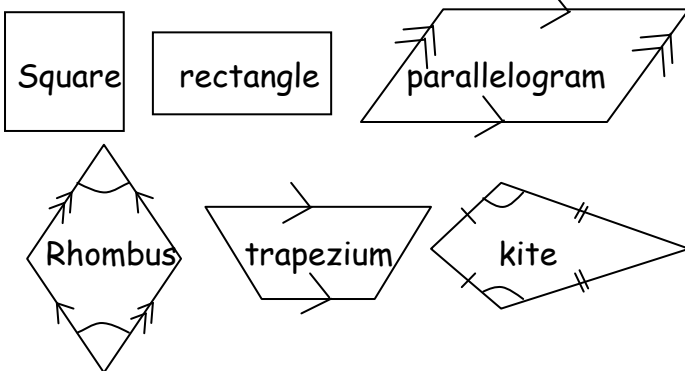
- Order of Rotational Symmetry**

this is the number of times a shape falls into its outline in one complete turn

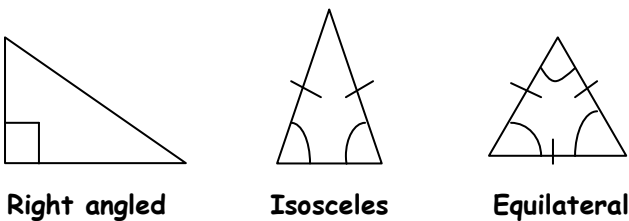


A parallelogram has rotational symmetry order 2

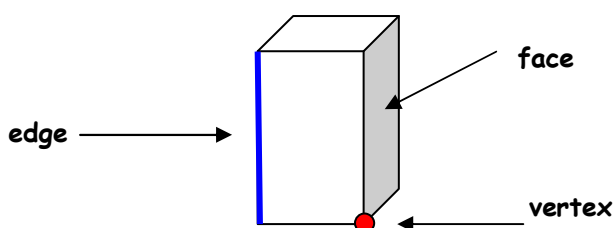
Names of shapes - Quadrilaterals



Names of shapes - Triangles



3D shape



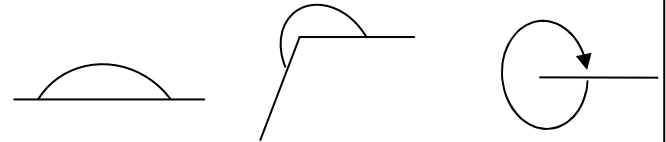
E14 Angles

- Types of angles**

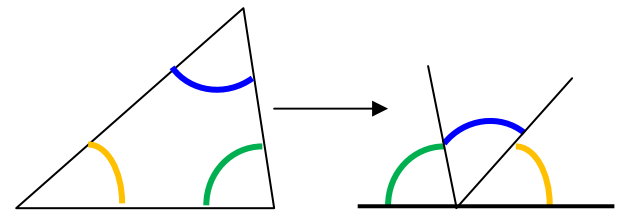
Acute (less than 90°) Right (Exactly 90°) Obtuse (Between 90° & 180°)



Straight line (180°) Reflex (Between 180° & 360°) Complete turn (360°)



- Angles of a triangle**

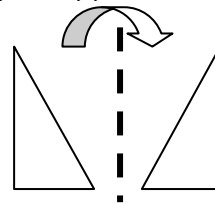


Angles of a triangle add up to 180°

E15 Transform Shapes

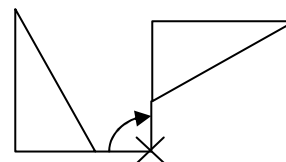
- Reflection**

A shape flipped over a line



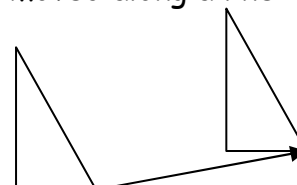
- Rotation**

A shape turned round a point

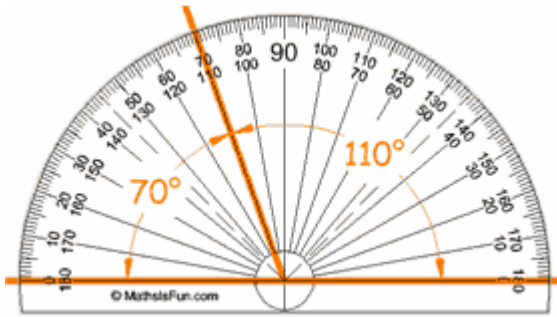


- Translation**

A shape moved along a line

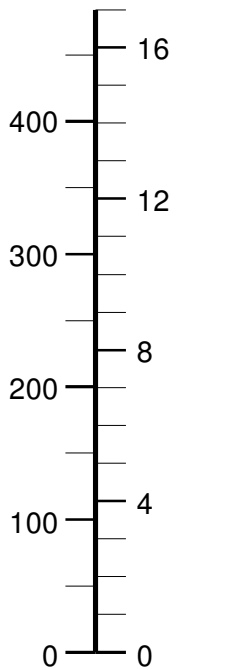


E16 Measure and draw angles



To be sure, count the number of degrees between the two arms of the angle

E17 Scales



Work out the value of each small division before taking any readings

E18 Units of measure

- Metric units**

| Length | Weight | Capacity |
|-------------|-------------|--------------------|
| 10mm = 1cm | 1000g = 1kg | 1000ml = 1 litre |
| 100cm = 1m | | 10ml = 1centilitre |
| 1000m = 1km | | |

- Imperial units**

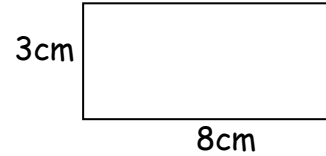
| Length | Weight | Capacity |
|----------------|------------------|---------------------|
| 1 inch = 2.5cm | 2.2 pounds ≈ 1kg | 1gallon ≈ 4.5litres |
| 1 foot = 30cm | | |
| 1 mile ≈ 1.6km | | |

E19 Area and perimeter of rectangle

Area is the amount of space inside the outline of a shape

Perimeter is the length of the outline of a shape

- Area of rectangle = length x width**



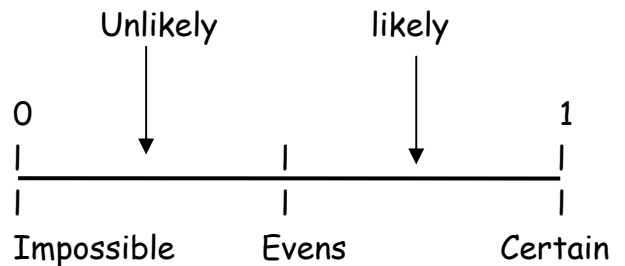
$$\begin{aligned} \text{Area of rectangle} &= l \times w \\ &= 8 \times 3 \\ &= \underline{24\text{cm}^2} \end{aligned}$$

- Perimeter of the rectangle**

$$\begin{aligned} \text{Perimeter} &= 3 + 8 + 3 + 8 \text{ OR } 2 \times 3 + 2 \times 8 \\ &= \underline{22\text{cm}} \end{aligned}$$

E20 Probability

- Probability scale**



- Calculate probability**

$$P(\text{event}) = \frac{\text{No. of outcomes which give the event}}{\text{Total number of outcomes}}$$

- Probability of an event NOT happening**

If $p(\text{event}) = p$

$$P(\text{event NOT happening}) = 1 - p$$

e.g. If $p(\text{rain}) = 0.3$

$$p(\text{NOT rain}) = 1 - 0.3 = 0.7$$

E21 Averages and Range

Mode - most frequent measure

Median - middle measure (put them in order)

Mean - total of measures \div no. of measures

Range - Highest minus lowest measure

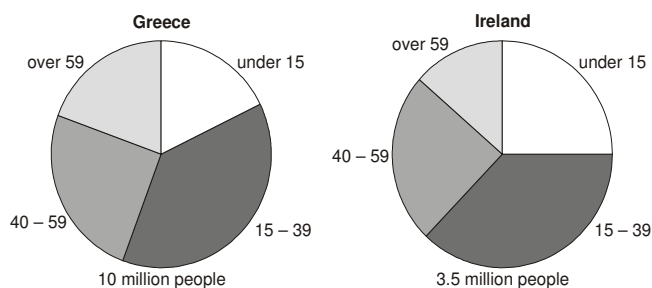
- **Range** measures how spread out the measures are
- **Mode, median & mean** gives an average
- The range and one of the averages is used to compare distributions

E22 Probability - repeating an experiment

LEARN

- Different outcomes are possible from repeating an experiment
- The larger the number of trials, the more valid the result

E23 Interpret graphs & diagrams



Here we are not told how many people in any of the sectors

We can therefore only comment on proportion by comparing the sizes of sectors in each pie chart

e.g. there is a larger proportion of the population under 15 in Ireland than Greece

It does not mean there are more people