Name _____ Date _____

Unit 12 · Ratio and proportion — revision sheet

Everything you need from every section. Read it before the end-of-unit test.

12.1 Understanding ratio

- A **ratio** compares amounts **part with part**: 3 : 2 means 3 of one for every 2 of the other.
- **Order matters.** 3 : 2 is not the same as 2 : 3.
- To **simplify**, divide every part by their highest common factor — exactly like a fraction.
- To find an **equivalent** ratio, multiply or divide every part by the same number.
- Before writing a ratio of two measurements, put them in the **same units**: 40 cm : 1 m becomes 40 : 100 = 2 : 5.
- A **fraction** compares part with **whole**. In 2 : 3 the first share is 2/5 of the whole, not 2/3.
- The total number of parts is the sum of the ratio: 2 : 3 has 5 parts.
- That confusion between 2/3 and 2/5 is the commonest error in the whole unit.

Key words: *ratio · simplest form · equivalent ratio · part · proportion*

```
squash 1 : 4
1 part syrup to 4 parts water
so 50 ml syrup needs 200 ml water
boys : girls = 2 : 3
girls : boys = 3 : 2
same class, different ratio
12 : 18
```

12.2 Sharing in a ratio

- **Add the ratio numbers** to find how many parts there are altogether.
- **Divide the total by that** to find what one part is worth.
- **Multiply** each ratio number by the value of one part.
- Three steps, always in that order: add, divide, multiply.
- **Check by adding the shares** — they must give the total back.
- The larger number in the ratio always takes the larger share.
- Working backwards: if one share is known, divide it by its ratio number to find one part.
- If two shares **differ** by a known amount, that difference is the difference of the ratio numbers, in parts.

Key words: *share · total parts · one part · divide in a ratio*

```
share 20 in the ratio 2 : 3
parts: 2 + 3 = 5
one part: 20 ÷ 5 = 4
shares: 8 and 12
8 + 12 = 20 ✓
if you had 8 and 10, the check fails
share 60 in 1 : 2 : 3
```

12.3 Direct proportion

- Two quantities are in **direct proportion** when doubling one doubles the other.
- Then dividing one by the other always gives the **same number** — the rate.
- The **unitary method**: find the value of one, then multiply.
- It is two steps: divide to get one, multiply to get many.
- The graph of two directly proportional quantities is a **straight line through the origin**.
- A taxi fare is **not** directly proportional to distance — the fixed charge lifts the graph off the origin.
- In **inverse** proportion, doubling one halves the other: twice as many workers, half the time.
- Ask “does zero of one give zero of the other?” — it is the quickest test for direct proportion.

Key words: *direct proportion · unitary method · rate · scale up · inverse proportion*

```
3 pens cost 12 → 4 each
6 pens cost 24 → 4 each
9 pens cost 36 → 4 each
5 pens cost 35
one pen: 35 ÷ 5 = 7
8 pens: 7 × 8 = 56
litres: 2 4 6
```