

# The Panda Math Tutor

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## Ratio, Rate and Proportion

Student Worksheet  
Questions & Working Space  
IGCSE Mathematics

Name: \_\_\_\_\_

Date: \_\_\_\_\_

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Teach → Practice → Reason → Apply → Challenge → Master

Contents

1 Part I — Topic-by-Topic Exercises 2

1.1 Simplifying Ratios . . . . . 2

1.2 Dividing a Quantity in a Given Ratio . . . . . 5

1.3 Rate and Unit Rate . . . . . 9

1.4 Speed, Distance and Time . . . . . 12

1.5 Distance–Time Graphs . . . . . 16

1.6 Velocity–Time Graphs . . . . . 19

1.7 Direct Proportion . . . . . 23

1.8 Inverse Proportion . . . . . 27

1.9 Percentage as Proportion . . . . . 31

1.10 Map Scales and Scale Drawings . . . . . 35

2 Part II — Mixed Review 38

3 Part III — Examination-Style Practice 42

**Note**

**How to use this worksheet.** These questions are built *strictly* on the *Ratio, Rate and Proportion* notes: simplifying ratios, dividing a quantity in a given ratio, rates and unit rates, speed–distance–time, distance–time and velocity–time graphs, direct proportion (including  $y \propto x^2$ ,  $x^3$  and  $\sqrt{x}$ ), inverse proportion, percentage as a proportion, and map scales.

**Working space.** Ruled lines are provided after each question — show *all* of your working there. Convert to a common unit *before* writing a ratio, state whether a problem is direct or inverse proportion before you solve it, and always show the step where you find the constant  $k$ . Harder questions have a teal **Hint** box; try the question first and use the hint only if you are stuck.

**Graphs.** Read values from the axes carefully. On a distance–time graph the gradient is the speed; on a velocity–time graph the gradient is the acceleration and the *area* underneath is the distance travelled.

**Checking your answers.** Full step-by-step solutions, a marking scheme for the exam paper, and a quick answer key are in the separate booklet “*Ratio, Rate and Proportion — Solutions & Answer Key.*” Try each question honestly before you look.

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## 1 Part I — Topic-by-Topic Exercises

### 1.1 Simplifying Ratios

**Exercise S1** *[Basic]*

Simplify the ratio 42 : 56.

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**Exercise S2** *[Basic]*

Simplify the ratio 45 : 75.

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**Exercise S3** [*Standard*]

Simplify the ratio  $18 : 30 : 48$ .

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**Exercise S4** [*Standard*]

Simplify the ratio  $2.4 : 0.6$ .

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**Exercise S5** [*Standard*]

Simplify the ratio  $0.35 : 1.4$ .

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**Hint**

Multiply *both* parts by the same power of 10 — enough to clear the decimal with the most decimal places.

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**Exercise S6** *[Intermediate]*

Simplify the ratio  $\frac{2}{3} : \frac{5}{6}$ .

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**Exercise S7** *[Intermediate]*

Simplify the ratio  $\frac{3}{5} : \frac{7}{10} : \frac{1}{2}$ .

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**Hint**

Multiply every part by the LCM of the denominators 5, 10 and 2.

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**Exercise S8** *[Advanced]*

Write the ratio of 750 g to 1.8 kg in its simplest form.

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**Exercise S9** [*Advanced*]

Write the ratio of 45 minutes to 3 hours in its simplest form.

**Exercise S10** [*Challenge*]

Write the ratio  $1.25 : 2$  in the form  $1 : n$ .

**Hint**

To make the first part equal to 1, divide *both* parts by 1.25. The answer does not have to be a whole number.

## 1.2 Dividing a Quantity in a Given Ratio

**Exercise B1** [*Basic*]

Share \$360 in the ratio  $4 : 5$ .

**Exercise B2** *[Basic]*

Divide 288 g in the ratio 5 : 7.

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**Exercise B3** *[Standard]*

Divide 540 ml in the ratio 2 : 3 : 4.

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**Exercise B4** *[Standard]*

Three cousins share £1260 in the ratio 3 : 4 : 5. Find how much each cousin receives.

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**Exercise B5** [Standard]

A concrete mix uses cement and sand in the ratio 2 : 7. A builder uses 84 kg of sand.

- (a) Find the mass of cement needed.
- (b) Find the total mass of the mix.

**Exercise B6** [Intermediate]

In a swimming club the ratio of boys to girls is 7 : 9. There are 26 more girls than boys.

- (a) Find the number of boys and the number of girls.
- (b) Find the total membership of the club.

**Hint**

The *difference* between the two shares is  $9 - 7 = 2$  parts, and that difference is worth 26 members.

## Preview ends here

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