

GCSE / IGCSE Maths – Ratio and Proportion

GCSE/IGCSE · Total marks: 44 · Answers on the last page

Practice on simplifying and sharing in a ratio, direct and inverse proportion, compound measures (speed, density, pressure), percentage change, compound interest and growth and decay. Section A is non-calculator; a calculator may be used in Sections B and C. Allow about 50 minutes.

Section A – Ratio skills (Non-calculator)

1. Write each ratio in its simplest form.
 - (a) $18 : 24$
 - (b) $0.5 : 2.5$
 - (c) $2.4 \text{ kg} : 600 \text{ g}$[3]
2. Share 840 pounds between Amy, Ben and Cara in the ratio $3 : 4 : 5$. [3]
3. Given that $a : b = 2 : 3$ and $b : c = 4 : 5$, find $a : b : c$. [2]
4. A recipe for 4 people uses 300 g of flour and 2 eggs. How much flour and how many eggs are needed for 10 people? [2]
5. Priya and Sam share some money in the ratio $5 : 2$. Priya receives 36 pounds more than Sam. How much money did they share in total? [3]

Section B – Proportion and compound measures (Calculator allowed)

6. y is directly proportional to the square of x . When $x = 4$, $y = 48$.
 - (a) Find a formula for y in terms of x .
 - (b) Find y when $x = 5$.
 - (c) Find the positive value of x when $y = 108$.[4]
7.
 - (a) It takes 6 identical pumps 20 minutes to empty a tank. How long would it take 8 such pumps?
 - (b) p is inversely proportional to the square root of q . When $q = 25$, $p = 8$. Find p when $q = 16$.[5]
8.
 - (a) A train travels 150 km in 2 hours 30 minutes. Find its average speed in km/h.
 - (b) How long does a car take to travel 210 km at an average speed of 84 km/h?
 - (c) Convert 60 km/h to metres per second. Give your answer to 3 significant figures.[4]
9.
 - (a) A block of metal has mass 540 g and volume 200 cm^3 . Find its density in g/cm^3 .
 - (b) A force of 600 N acts on an area of 0.4 m^2 . Find the pressure in N/m^2 .[4]
10.
 - (a) 2500 pounds is invested at 3.2 percent per year compound interest. Find the value of the investment after 4 years. Give your answer to the nearest penny.
 - (b) A car bought for 18 000 pounds loses 15 percent of its value each year. Find its value after 3 years.[5]

Section C – Problem solving (Calculator allowed)

11. The population of a town is 1.2 million and is increasing by 2.5 percent each year. After how many whole years will the population first exceed 1.5 million? [3]

12. (a) In a class the ratio of boys to girls is $3 : 5$. When 4 more boys join the class the ratio becomes $4 : 5$. How many students were in the class originally?
- (b) The exchange rate is 1 pound = 1.15 euros. A jacket costs 276 euros in France and 245 pounds in the UK. In which country is it cheaper, and by how many pounds? [6]

Answers

Check your working against these. If an answer does not match, try the question again before looking for the method.

1. (a) 3 : 4
(b) 1 : 5
(c) 4 : 1
2. Amy 210 pounds, Ben 280 pounds, Cara 350 pounds
3. 8 : 12 : 15
4. 750 g of flour and 5 eggs
5. 3 parts = 36, so 1 part = 12; total = $7 \times 12 = 84$ pounds
6. (a) $y = 3x^2$
(b) $y = 75$
(c) $x = 6$
7. (a) $6 \times 20 = 120$ pump-minutes; $120 \div 8 = 15$ minutes
(b) $p = \frac{40}{\sqrt{q}}$; $p = 10$
8. (a) 60 km/h
(b) 2.5 hours = 2 h 30 min
(c) $\frac{60000}{3600} = 16.7$ m/s
9. (a) 2.7 g/cm^3
(b) 1500 N/m^2
10. (a) $2500 \times 1.032^4 = 2835.69$ pounds
(b) $18000 \times 0.85^3 = 11054.25$ pounds
11. $1.025^n > 1.25$; $1.025^9 = 1.249$ (not enough), $1.025^{10} = 1.280$; so 10 years
12. (a) $\frac{3x+4}{5x} = \frac{4}{5} \Rightarrow 15x+20=20x \Rightarrow x=4$; originally $12+20=32$ students
(b) $276 \div 1.15 = 240$ pounds; cheaper in France by 5 pounds

Need this topic taught, not just practised? Book a trial lesson at 50% off with Mr. Ahmad — online worldwide or in person in Dubai.

WhatsApp +971 55 373 5695 · mathandsciencetutor.com