

GRADE 8 MATHS

Ratio, Proportion & Rates

Complete Printable Worksheet Pack

6 Worksheets • Ratios • Sharing • Unit Rates • Proportion • Scale • Real-Life Applications • Challenge

Worksheet 1: Ratios & Equivalent Ratios

Name: _____ Date: _____

1. Simplify the ratio 36:48.
2. Find an equivalent ratio to 5:8 with second term 40.
3. Are 18:24 and 21:28 equivalent? Explain.
4. Divide \$420 in the ratio 3:4.
5. The ratio of boys to girls is 5:7. If there are 35 boys, how many girls are there?
6. Simplify 2.4:3.6.
7. A recipe uses flour and sugar in the ratio 5:2. If 750 g of flour is used, how much sugar is needed?
8. The ratio of red to blue beads is 4:9. If there are 117 blue beads, how many red beads are there?
9. Find the ratio of 45 minutes to 1.5 hours in simplest form.
10. Explain why multiplying both parts of a ratio by the same non-zero number keeps the ratio equivalent.

Answer Key — Worksheet 1

1. 3:4.
2. 25:40.
3. Yes; both simplify to 3:4.
4. Total parts=7; shares=\$180 and \$240.
5. 49 girls.
6. 2:3.
7. 300 g.
8. 52 red beads.
9. $45:90=1:2$.
10. Both parts are scaled by the same factor, so their relative comparison is unchanged.

Worksheet 2: Sharing in a Ratio

Name: _____ Date: _____

1. Share 560 in the ratio 3:5.
2. Share \$900 in the ratio 2:3:4.
3. Three friends share 720 points in the ratio 2:3:4. How many points does each receive?
4. A class has boys and girls in the ratio 4:5. There are 36 boys. Find the total number of students.
5. A map uses a road-to-river ratio of 7:3. If the road section is 35 cm, find the river section.
6. Two numbers are in the ratio 5:8 and have a difference of 39. Find the numbers.
7. The sides of a triangle are in the ratio 3:4:5 and its perimeter is 48 cm. Find all three sides.
8. A prize fund is shared among A, B and C in the ratio 2:5:8. If C receives \$240 more than A, find the total fund.
9. A mixture contains oil and solvent in the ratio 3:7. How much solvent is needed for 450 mL of oil?
10. Explain why the largest share in a ratio does not always mean the largest absolute amount unless the total is fixed.

Answer Key — Worksheet 2

1. 210 and 350.
2. \$200, \$300, \$400.
3. 160, 240, 320 points.
4. Girls=45; total=81.
5. 15 cm.
6. 65 and 104.
7. 12 cm, 16 cm, 20 cm.
8. Difference is 6 parts=\$240, so 1 part=\$40; total=15 parts=\$600.
9. 1050 mL solvent.
10. A ratio describes relative parts; actual amounts depend on the total quantity being shared.

Worksheet 3: Rates & Unit Rates

Name: _____ Date: _____

1. A car travels 180 km in 3 hours. Find its average speed.
2. A shop sells 6 notebooks for \$15. Find the cost per notebook.
3. A tap fills 48 L in 6 minutes. Find its rate in L/min.
4. A worker earns \$144 for 8 hours. Find the hourly rate.
5. A train travels 315 km in 3.5 hours. Find its average speed.
6. Which is better value: 750 g for \$6 or 1.2 kg for \$9?
7. A printer produces 240 pages in 8 minutes. At the same rate, how many pages in 15 minutes?
8. A cyclist travels 42 km in 2.5 hours. Find the average speed.
9. A recipe serves 8 people using 600 g of rice. How much rice per person?
10. Explain why unit rates are useful when comparing prices or speeds.

Answer Key — Worksheet 3

1. 60 km/h.
2. \$2.50 per notebook.
3. 8 L/min.
4. \$18/hour.
5. 90 km/h.
6. 750 g costs \$8/kg; 1.2 kg costs \$7.50/kg, so 1.2 kg for \$9 is better value.
7. 450 pages.
8. 16.8 km/h.
9. 75 g/person.
10. A unit rate puts different quantities on the same one-unit basis, making comparisons easier.

Worksheet 4: Proportion & Scale

Name: _____ Date: _____

1. Solve: $\frac{5}{8} = \frac{x}{40}$.
2. Solve: $\frac{7}{12} = \frac{21}{x}$.
3. A map scale is 1 cm : 8 km. What real distance is represented by 6.5 cm?
4. A model car uses a scale of 1:20. If the model is 18 cm long, how long is the real car?
5. A recipe for 6 people uses 450 g of flour. How much flour is needed for 14 people?
6. Four workers complete a job in 15 days at the same rate. How many worker-days are required?
7. A photograph is 12 cm by 8 cm. It is enlarged proportionally so its width becomes 15 cm. Find the new length.
8. A map distance of 7.2 cm represents 54 km. Find the scale in km per cm.
9. If 9 pens cost \$13.50, what is the cost of 14 pens at the same rate?
10. Explain how you can check whether two ratios form a proportion.

Answer Key — Worksheet 4

1. $x=25$.
2. $x=36$.
3. 52 km.
4. 360 cm=3.6 m.
5. 1050 g.
6. 60 worker-days.
7. Scale factor= $\frac{15}{8}$; new length=22.5 cm.
8. 7.5 km per cm.
9. \$21.
10. Cross-multiply: $a:b=c:d$ if $a \times d = b \times c$.

Worksheet 5: Ratio, Proportion & Rates in Real Life

Name: _____ Date: _____

1. A car uses 8 L of fuel for 120 km. How much fuel is needed for 450 km at the same rate?
2. A school mixes paint in the ratio 3:2 for blue:red. If 1.8 L of blue is used, how much red is needed?
3. A recipe uses 250 g of flour for 10 muffins. How much flour is needed for 36 muffins?
4. A cyclist rides at 24 km/h for 1.75 hours. Find the distance travelled.
5. A shop offers 3 bottles for \$8.40. At the same unit price, what would 11 bottles cost?
6. A map scale is 1:50,000. Two towns are 7.4 cm apart on the map. Find the real distance in km.
7. A machine makes 540 parts in 6 hours. How many parts can it make in 8.5 hours at the same rate?
8. A class of 40 students has a boys:girls ratio of 3:2. How many more boys than girls are there?
9. A 15 m rope is cut in the ratio 2:3:5. Find the length of each piece.
10. A journey is 360 km. The first 120 km is travelled at 60 km/h and the remaining distance at 80 km/h. Find the total travel time, ignoring stops.

Answer Key — Worksheet 5

1. 30 L.
2. 1.2 L red.
3. 900 g.
4. 42 km.
5. \$30.80.
6. 3.7 km.
7. 765 parts.
8. Boys=24, girls=16; 8 more boys.
9. 3 m, 4.5 m, 7.5 m.
10. First part=2 h; remaining 240 km=3 h; total=5 h.

Worksheet 6: Ratio, Proportion & Rates Challenge

Name: _____ Date: _____

1. Two numbers are in the ratio 7:11. Their sum is 216. Find both numbers.
2. A solution contains chemical A and water in the ratio 2:13. How much water must be added to 300 mL of solution to make the ratio 1:8?
3. A journey is split into two parts in the ratio 3:5. The first part takes 1.5 hours at 48 km/h. Find the speed for the second part if the total journey time is 4 hours.
4. A map uses a scale of 1:250,000. A triangular route has sides 3.2 cm, 4.5 cm and 5.1 cm on the map. Find its real perimeter in km.
5. A shop mixes two grades of rice costing \$4/kg and \$7/kg in the ratio 2:3. Find the cost per kg of the mixture.
6. A car travels the first half of a journey at 60 km/h and the second half at 90 km/h. If the total distance is 300 km, find the total time and average speed.
7. Three quantities are in the ratio 2:3:7. The difference between the largest and smallest is 85. Find all three.
8. A factory's output is directly proportional to hours worked. It produces 1,260 units in 7 hours. How many hours are needed for 2,700 units?
9. A recipe is scaled from 8 servings to 14 servings. One ingredient originally needs $\frac{3}{4}$ cup. How much is needed now?
10. Explain the difference between a ratio, a rate and a proportion, giving one example of each.

Answer Key — Worksheet 6

1. 84 and 132.
2. In 300 mL, A=40 mL and water=260 mL. To make A:water=1:8, water must be 320 mL, so add 60 mL.
3. First distance=72 km. Total distance=192 km, so second distance=120 km. Second time=2.5 h; speed=48 km/h.
4. Map perimeter=12.8 cm; real perimeter= $12.8 \times 250,000$ cm=32 km.
5. Cost= $(2 \times 4 + 3 \times 7) / 5 = \$5.80/\text{kg}$.
6. First half=150 km at 60=2.5 h; second=150 km at 90=1 h 40 min. Total=4 h 10 min; average speed= $300 / (25/6) = 72$ km/h.
7. Difference is 5 parts=85, so 1 part=17; quantities=34, 51, 119.
8. Rate=180 units/hour; $2700/180=15$ hours.
9. $3/4 \times 14/8 = 21/16 = 1 \frac{5}{16}$ cups.
10. Ratio compares quantities, rate compares quantities with different units per one unit, and proportion states that two ratios are equal.