Educational Material

Grade 7 Mathematics Worksheet

Ratio and Direct Proportion

Name: _____ **Date:** _____ **Class:** _____

Learning Objectives

By the end of this worksheet, you will be able to: - Simplify ratios to their lowest terms - Find equivalent ratios - Share quantities in given ratios - Solve direct proportion problems using the unitary method - Apply ratio and proportion to real-world situations

Instructions

- Show all your working clearly
- Simplify ratios where possible
- Include correct units in your answers
- Check that your answers make sense

Section A: Simplifying Ratios (8 marks)

Simplify these ratios to their lowest terms:

1. 12 : 18 = _____ : _____

2. 15 : 25 = _____ : _____

3. 24 : 36 : 48 = _____ : _____ : _____

4. 20 : 35 = _____ : _____

5. 16 : 24 : 32 = _____ : _____ : _____

6. 45 : 60 = _____ : _____

7. 21 : 28 : 35 = _____ : _____ : _____

8. 72 : 108 = _____ : _____

___

Section B: Equivalent Ratios (6 marks)

Complete these equivalent ratios:

9. 3 : 5 = 12 : _____

10. 2 : 7 = _____ : 21

11. 4 : 9 = 20 : _____

12. 5 : 8 = _____ : 32

13. 6 : 11 = 18 : _____

14. 7 : 10 = _____ : 50

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Section C: Sharing in Given Ratios (10 marks)

Share these quantities in the given ratios:

15. Share £240 in the ratio 3 : 5 **Answer:** £_____ : £_____

16. Share 72 sweets in the ratio 5 : 7 **Answer:** _____ : _____

17. Share 150 cm in the ratio 2 : 3 : 5 **Answer:** _____ cm : _____ cm : _____ cm

18. Share £420 in the ratio 4 : 3 : 7 **Answer:** £_____ : £_____ : £_____

19. Share 96 books in the ratio 5 : 3 **Answer:** _____ : _____

20. Share 210 minutes in the ratio 2 : 3 : 4 : 5 **Answer:** _____ min : _____ min : _____ min : _____ min

21. Share 180 kg in the ratio 7 : 5 **Answer:** _____ kg : _____ kg

22. Share £675 in the ratio 3 : 4 : 8 **Answer:** £_____ : £_____ : £_____

23. Share 144 marbles in the ratio 1 : 3 : 5 **Answer:** _____ : _____ : _____

24. Share 280 ml in the ratio 3 : 4 **Answer:** _____ ml : _____ ml

___

Section D: Direct Proportion (8 marks)

Solve these direct proportion problems:

25. If 5 pencils cost £3, how much do 8 pencils cost? **Answer:** £_____

26. If 12 oranges weigh 2.4 kg, how much do 20 oranges weigh? **Answer:** _____ kg

27. If 6 workers can build a wall in 15 days, how long would it take 10 workers?
    Answer: _____ days

28. If 4 meters of fabric cost £18, how much does 7 meters cost? **Answer:** £_____

29. If 9 identical books weigh 2.7 kg, what is the weight of 15 books? **Answer:** _____ kg

30. If 8 tins of paint cover 120 m², how many tins are needed to cover 195 m²? **Answer:**
    _____ tins

31. If £45 can be exchanged for $60, how many dollars can £75 be exchanged for?
    Answer: $_____

32. If a car travels 180 km in 2.5 hours, how far will it travel in 4 hours at the same
    speed? **Answer:** _____ km

Section E: Real-World Applications (8 marks)

Apply ratio and proportion to these practical problems:

33. **Recipe Problem**: A recipe for 4 people needs 300g flour, 200g sugar, and 150g
    butter.

    ○ How much of each ingredient is needed for 6 people?

    Flour: _____ g **Sugar:** _____ g **Butter:** _____ g

34. **Paint Mixing**: Red and blue paint are mixed in the ratio 3 : 2 to make purple paint.

    ○ How much red paint is needed if 8 litres of blue paint is used?
    ○ How much purple paint will be made in total?

    Red paint: _____ litres **Total purple paint:** _____ litres

35. **School Ratio**: In a school, the ratio of boys to girls is 4 : 5. There are 720 students in
    total.

    ○ How many boys are there?
    ○ How many girls are there?

    Boys: _____ **Girls:** _____

36. **Speed and Distance**: A train travels at a constant speed. It covers 450 km in 3 hours.

    ○ How far will it travel in 5 hours?
    ○ How long will it take to travel 600 km?

    Distance in 5 hours: _____ km **Time for 600 km:** _____ hours

37. **Currency Exchange**: £1 = $1.40 and £1 = €1.20

    ○ Convert £85 to dollars

- ○ Convert £60 to euros
- ○ If someone has $210, how many pounds is this worth?

Dollars: $_____   Euros: €_____   Pounds: £_____

38. **Profit Sharing**: Three business partners share profits in the ratio 2 : 3 : 4. The total profit is £18,000.

    - ○ How much does each partner receive?

    Partner 1: £_____   Partner 2: £_____   Partner 3: £_____

39. **Map Scale Ratio**: On a map, 2 cm represents 5 km in real life.

    - ○ What is the ratio of the map scale?
    - ○ If two cities are 12 cm apart on the map, what is the real distance?

    Scale ratio: _____ : _____   Real distance: _____ km

40. **Mixture Problem**: Coffee beans are mixed in the ratio Colombian : Brazilian : Ethiopian = 3 : 2 : 1.

    - ○ If 24 kg of Colombian beans are used, how much of each of the other types is needed?
    - ○ What is the total weight of the mixture?

    Brazilian: _____ kg Ethiopian: _____ kg Total: _____ kg

Total: _____ / 40 marks

Self-Assessment

- I can simplify ratios: □ Confident □ Mostly □ Need practice
- I can find equivalent ratios: □ Confident □ Mostly □ Need practice
- I can share quantities in given ratios: □ Confident □ Mostly □ Need practice
- I can solve proportion problems: □ Confident □ Mostly □ Need practice

Key Methods to Remember

- **Simplifying ratios:** Divide all parts by their highest common factor
- **Sharing in ratios:** Find total parts, then calculate each share
- **Direct proportion:** If one quantity increases, the other increases proportionally
- **Unitary method:** Find the value of one unit, then multiply