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## Educational Worksheet

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### Answer Key: Ratio and Direct Proportion Problems

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**Grade 7 Mathematics - Medium Difficulty**

**Total Marks: 40**

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#### Section A: Simplifying Ratios

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1.  $12 : 18 = \underline{2 : 3}$

2.  $15 : 25 = \underline{3 : 5}$

3.  $24 : 36 : 48 = \underline{2 : 3 : 4}$

4.  $20 : 35 = \underline{4 : 7}$

5.  $16 : 24 : 32 = \underline{2 : 3 : 4}$

6.  $45 : 60 = \underline{3 : 4}$

7.  $21 : 28 : 35 = \underline{3 : 4 : 5}$

8.  $72 : 108 = \underline{2 : 3}$

#### Section B: Equivalent Ratios

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9.  $3 : 5 = 12 : \underline{20}$

10.  $2 : 7 = \underline{6} : 21$

11.  $4 : 9 = 20 : \underline{45}$

12.  $5 : 8 = \underline{20} : 32$

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13.  $6 : 11 = 18 : \underline{33}$

14.  $7 : 10 = \underline{35} : 50$

## Section C: Sharing in Given Ratios

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15. Total parts = 8;  $£240 \div 8 = £30$ ; **£90 : £150**

16. Total parts = 12;  $72 \div 12 = 6$ ; **30 : 42**

17. Total parts = 10;  $150 \div 10 = 15$ ; **30 cm : 45 cm : 75 cm**

18. Total parts = 14;  $£420 \div 14 = £30$ ; **£120 : £90 : £210**

19. Total parts = 8;  $96 \div 8 = 12$ ; **60 : 36**

20. Total parts = 14;  $210 \div 14 = 15$ ; **30 min : 45 min : 60 min : 75 min**

21. Total parts = 12;  $180 \div 12 = 15$ ; **105 kg : 75 kg**

22. Total parts = 15;  $£675 \div 15 = £45$ ; **£135 : £180 : £360**

23. Total parts = 9;  $144 \div 9 = 16$ ; **16 : 48 : 80**

24. Total parts = 7;  $280 \div 7 = 40$ ; **120 ml : 160 ml**

## Section D: Direct Proportion

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25.  $£3 \div 5 \times 8 = \underline{£4.80}$

26.  $2.4 \div 12 \times 20 = \underline{4 \text{ kg}}$

27.  $6 \times 15 \div 10 = \underline{9 \text{ days}}$

28.  $£18 \div 4 \times 7 = \underline{£31.50}$

29.  $2.7 \div 9 \times 15 = \underline{4.5 \text{ kg}}$

30.  $120 \div 8 \times 195 \div 120 = \underline{13 \text{ tins}}$

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31.  $\$60 \div \pounds45 \times \pounds75 = \underline{\$100}$

32.  $180 \div 2.5 \times 4 = \underline{288 \text{ km}}$

## Section E: Real-World Applications

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33. Flour: 450g, Sugar: 300g, Butter: 225g

34. Red paint: 12 litres, Total: 20 litres

35. Total parts = 9; Boys:  $4 \times 80 = \underline{320}$ ; Girls:  $5 \times 80 = \underline{400}$

36. Distance: 750 km, Time: 4 hours

37. \$119, €72, £150

38. Total parts = 9; £4,000 : £6,000 : £8,000

39. 1:250,000, Real distance: 30 km

40. Brazilian: 16 kg, Ethiopian: 8 kg, Total: 48 kg

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## Teaching Notes

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### Common Mistakes to Watch For:

- **Ratio Simplification**: Not reducing ratios to lowest terms
- **Total Parts**: Forgetting to add all ratio parts together
- **Direction of Proportion**: Confusing which values increase/decrease together
- **Units**: Mixing different units in ratio calculations

### Extension Activities:

- Research ratios in cooking recipes from different countries
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- Calculate gear ratios in bicycles or cars
  - Explore golden ratio in art and nature
  - Create scale models using ratio calculations

### Assessment Criteria:

- **Excellent (36-40 marks)**: Confident with all ratio and proportion concepts
  - **Good (30-35 marks)**: Mostly accurate, minor calculation errors
  - **Satisfactory (24-29 marks)**: Basic understanding, some ratio simplification issues
  - **Needs Support (<24 marks)**: Requires additional practice with ratio concepts
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*This answer key corresponds to: ratio-proportion-problems.md*