2. A and B are on the x-axis at A(0, 0) and B(9, 0). Find the coordinate of the point that divides AB in the ratio 2:1, measured from A.

3. Points C(1, 4) and D(5, 4) lie on the same horizontal line. What is the ratio of the vertical change to the horizontal change from C to D? Give the ratio in simplest form.

4. Find the ratio rise:run (simplified) of the line through E(2, 5) and F(5, 11).

5. Point H is at (4, 6). Write the ratio x:y for H in simplest form.

6. A rectangle has opposite corners at (0, 0) and (8, 6). What is the ratio of its width to its height in simplest form?

7. A point P divides the segment from (1, 1) to (7, 4) in the ratio 1:2, measured from (1,1). What are the coordinates of P?

8. Points A(2, 2) and B(2, 8) lie on a vertical line. What is the ratio of horizontal distance to vertical distance from A to B, in simplest form?

9. Find the slope of the line through (0, 5) and (10, 0) written as a ratio rise:run in simplest form (include the sign).

10. If you scale every coordinate of the point (2, 3) by the ratio 3:1 (multiply both coordinates by 3), what are the new coordinates?

11. A right triangle has vertices at (0,0), (6,0), and (0,9). What is the ratio of the base to the height in simplest form?

12. A point (x, y) has x:y = 3:4 and x + y = 28. Find x and y.

13. The segment from (0,0) to (12,0) is divided into 4 equal parts. What is the ratio of the length of the first part to the whole segment?

14. Find the midpoint of the segment with endpoints (3, 7) and (9, 1). What ratio does the midpoint divide the segment into?

15. The line through (a, 2) and (5, 8) has rise:run = 3:2. Find a.

Ratios and measurement (16-35)

16. A recipe calls for 2 cups of flour for every 3 cups of sugar. If you use 8 cups of sugar, how many cups of flour do you need?

17. A map has a scale of 1:50,000 (1 cm on the map = 50,000 cm in real life). How many kilometers apart are two towns that are 3 cm apart on the map?

18. A model car is made at a scale of 1:24. If the real car is 4.8 meters long, what is the model's length in centimeters?

19. A rectangle is 8 m by 5 m. If both length and width are multiplied by the ratio 3:2, what are the new dimensions?

20. A small playground is enlarged using a scale factor of 2. What happens to the perimeter and to the area? (State how each changes in relation to the original.)

21. A rope is cut in the ratio 3:5 into two pieces. If the longer piece is 15 m, what was the total length of the rope?

22. A photo is reduced so that 1.5 cm on the reduction equals 6 cm on the original. What is the scale ratio (reduced:original) in simplest fractional form?

23. A swimming pool model uses a scale where 1 cm = 2 m. What length in meters does 7.5 cm on the model represent?

24. A rectangular poster is scaled down by a ratio of 1:4 (linear). If the original poster area is 48 square meters, what is the area of the scaled poster?

25. A pencil that was 18 cm long is shortened to $\frac{3}{4}$ of its original length. What is the new length?

26. A 5:2 ratio of red to blue paint is used to mix 35 liters of paint total. How many liters of red paint are used?

27. A playground fence is painted with stripes that are in the ratio 2:3 (yellow:green). If the fence is split into 25 equal panels, how many panels are yellow and how many are green?

28. A scale drawing uses 1 inch to represent 3 feet. If a wall is 24 feet long in real life, how long is it on the drawing in inches?

29. A cube's edge length is doubled. By what factor does its surface area increase? By what factor does its volume increase?

30. A jogger ran 5 kilometers in 30 minutes. What is the ratio of distance to time in simplest form (km:minutes)?

31. A rectangular flag has width to height in ratio 5:2. If the height is 8 cm, what is the width?

32. A recipe scaled down by ratio 2:5 uses 4 eggs originally. How many eggs should be used in the scaled-down recipe? (Assume eggs can be treated fractionally.)

33. A garden bed is 12 m long and 4 m wide. A similar bed is made with linear dimensions in ratio 1:3. What are the dimensions of the larger bed?

34. A model airplane's wingspan is 30 cm. The real airplane's wingspan is 18 m. What is the scale ratio (model:real) in simplest form (use same units)?

35. A wooden plank that is 2 meters long is cut into pieces in the ratio 1:4:5. What is the length of the middle piece?

Part-to-whole ratio word problems using tables (36-50)

36. Table A lists colors of marbles in a jar. The ratio red:blue is 3:5 and there are 40 marbles total. How many red and how many blue marbles are there?

37. A class has boys and girls in the ratio 7:5. If there are 24 girls, how many boys are there and what is the total class size? Fill the table: Boys | Girls | Total.

38. A fruit basket has apples:oranges = 4:3 and there are 28 pieces of fruit total. Complete the table and state number of apples and oranges.

39. A table shows parts of a group where purple:green = 2:3 and total = 25. How many of each color? (If needed, allow that parts may need to be whole numbers; assume the ratio fits.)

40. A table gives the ratio tea:coffee = 5:7 in a caf? and total drinks sold = 60. How many teas and coffees were sold?

41. A table shows dogs:cats = 3:4 in a shelter. If there are 56 animals total, how many dogs and how many cats?

42. A school survey table shows bikes:walkers = 2:5 and 49 students responded. How many biked and how many walked?

43. A jar contains coins in the ratio pennies:nickels:dimes = 4:2:1. If there are 35 coins total, how many of each coin are there? (Assume this ratio divides evenly.)

44. A fundraiser table shows sponsorships small:medium:large = 3:4:5 and there are 60 sponsors total. How many in each category?

45. A table records parts of a pack ratio A:B = 7:3 and total = 100. How many A's and B's?

46. A class has students who prefer math:science = 9:11 and 40 students prefer science. How many prefer math and what is the total?

47. A box contains red and white balls in ratio 5:6. If there are 55 balls total, complete the table and find counts of each color.

48. A fruit table lists bananas:grapes = 4:9 and the number of grapes is 27. How many bananas and what is the total fruit count?

49. A table shows ratio young:old = 2:3 in a group of trees, and there are 45 old trees. How many young trees and total trees?

50. A school cafeteria serves meals in ratio vegetarian:regular = 1:6. If 210 regular meals are served, how many vegetarian meals are served and what is the total number of meals?