

# Dividing Fractions by Fractions

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 24

## Q Quick Review

Dividing by a fraction means asking “how many of *this* fit inside *that*?” The quick rule is **keep, change, flip**: keep the first fraction, change  $\div$  to  $\times$ , and flip the second fraction to its **reciprocal** (swap its top and bottom). So  $\frac{3}{4} \div \frac{1}{2}$  becomes  $\frac{3}{4} \times \frac{2}{1}$ . Then multiply across and write the answer in **simplest form**. A whole number like 6 is just  $\frac{6}{1}$ , so the same rule works there too.

◊ **Example:** Find  $\frac{2}{3} \div \frac{4}{5}$ .

⇒ We want to know how many groups of  $\frac{4}{5}$  fit into  $\frac{2}{3}$ . Use keep, change, flip: keep  $\frac{2}{3}$ , change the  $\div$  to  $\times$ , and flip  $\frac{4}{5}$  to get its reciprocal  $\frac{5}{4}$ . Now multiply:  $\frac{2}{3} \times \frac{5}{4} = \frac{2 \times 5}{3 \times 4} = \frac{10}{12}$ . Both numbers share a factor of 2, so divide top and bottom by 2 to get  $\frac{5}{6}$ . Since  $\frac{5}{6}$  is less than 1, less than one whole group fits — that makes sense!

**Answer:**  $\frac{5}{6}$

## PRACTICE

Divide. Write each answer in simplest form.

- |                                     |       |                                      |       |
|-------------------------------------|-------|--------------------------------------|-------|
| 1. $\frac{3}{4} \div \frac{1}{2}$   | _____ | 11. $\frac{4}{9} \div \frac{2}{3}$   | _____ |
| 2. $\frac{1}{2} \div \frac{1}{4}$   | _____ | 12. $\frac{5}{12} \div \frac{5}{6}$  | _____ |
| 3. $\frac{4}{5} \div \frac{2}{5}$   | _____ | 13. $\frac{2}{3} \div \frac{5}{6}$   | _____ |
| 4. $\frac{5}{8} \div \frac{5}{16}$  | _____ | 14. $\frac{3}{5} \div \frac{9}{10}$  | _____ |
| 5. $\frac{3}{8} \div \frac{3}{4}$   | _____ | 15. $\frac{8}{15} \div \frac{4}{5}$  | _____ |
| 6. $\frac{7}{10} \div \frac{7}{10}$ | _____ | 16. $\frac{11}{12} \div \frac{1}{6}$ | _____ |
| 7. $\frac{5}{6} \div \frac{1}{3}$   | _____ | 17. $\frac{7}{12} \div \frac{7}{8}$  | _____ |
| 8. $\frac{9}{10} \div \frac{3}{5}$  | _____ | 18. $\frac{3}{10} \div \frac{9}{20}$ | _____ |
| 9. $\frac{2}{9} \div \frac{1}{3}$   | _____ | 19. $\frac{4}{7} \div \frac{8}{21}$  | _____ |
| 10. $\frac{7}{8} \div \frac{1}{2}$  | _____ | 20. $\frac{5}{6} \div \frac{15}{8}$  | _____ |

### ◆ Word Problems

21. A baker has 6 cups of flour and each batch of muffins needs  $\frac{3}{4}$  cup. How many batches can the baker make? \_\_\_\_\_
22. A ribbon is  $\frac{3}{4}$  yard long. Pieces of length  $\frac{1}{8}$  yard are cut from it. How many pieces can be cut? \_\_\_\_\_
23. A water jug holds  $\frac{1}{2}$  gallon. A small cup holds  $\frac{1}{6}$  gallon. How many cups fill the jug? \_\_\_\_\_
24. A trail is  $\frac{7}{8}$  mile long. Marker posts are placed every  $\frac{1}{4}$  mile. How many  $\frac{1}{4}$ -mile sections is the trail? \_\_\_\_\_



## Answer Keys

1.  $\frac{3}{2}$
2.  $2$
3.  $2$
4.  $2$
5.  $\frac{1}{2}$
6.  $1$
7.  $\frac{5}{2}$
8.  $\frac{3}{2}$
9.  $\frac{2}{3}$
10.  $\frac{7}{4}$
11.  $\frac{2}{3}$
12.  $\frac{1}{2}$

13.  $\frac{4}{5}$
14.  $\frac{2}{3}$
15.  $\frac{2}{3}$
16.  $\frac{11}{2}$
17.  $\frac{2}{3}$
18.  $\frac{2}{3}$
19.  $\frac{3}{2}$
20.  $\frac{4}{9}$
21. 8 batches
22. 6 pieces
23. 3 cups
24.  $\frac{7}{2}$  sections

### Step-by-Step Explanations

1. Keep, change, flip:  $\frac{3}{4} \times \frac{2}{1} = \frac{6}{4} = \frac{3}{2}$ .
2.  $\frac{1}{4} \times \frac{4}{2} = \frac{4}{2} = 2$ . Four quarters of a unit, but here just 2 fit into a half.
3.  $\frac{1}{5} \times \frac{20}{10} = \frac{20}{10} = 2$ . Two groups of  $\frac{2}{5}$  fit inside  $\frac{4}{5}$ .
4.  $\frac{16}{5} \times \frac{5}{80} = \frac{80}{80} = 2$ .
5.  $\frac{4}{3} \times \frac{12}{24} = \frac{12}{24} = \frac{1}{2}$ .
6. Any number divided by itself is 1 — exactly one group fits.
7.  $\frac{5}{6} \times \frac{3}{1} = \frac{15}{6} = \frac{5}{2}$ .
8.  $\frac{9}{10} \times \frac{30}{30} = \frac{45}{30} = \frac{3}{2}$ .
9.  $\frac{2}{3} \times \frac{3}{1} = \frac{6}{3} = 2$ .
10.  $\frac{7}{4} \times \frac{2}{1} = \frac{14}{4} = \frac{7}{2}$ .
11.  $\frac{1}{9} \times \frac{3}{3} = \frac{12}{18} = \frac{2}{3}$ .
12.  $\frac{5}{12} \times \frac{6}{6} = \frac{30}{60} = \frac{1}{2}$ .

13.  $\frac{2}{3} \times \frac{6}{5} = \frac{12}{15} = \frac{4}{5}$ .
14.  $\frac{3}{5} \times \frac{10}{9} = \frac{30}{45} = \frac{2}{3}$ .
15.  $\frac{8}{15} \times \frac{4}{5} = \frac{40}{60} = \frac{2}{3}$ .
16.  $\frac{11}{12} \times \frac{6}{1} = \frac{66}{12} = \frac{11}{2}$ .
17.  $\frac{7}{12} \times \frac{8}{7} = \frac{56}{84} = \frac{2}{3}$ .
18.  $\frac{3}{10} \times \frac{20}{9} = \frac{60}{90} = \frac{2}{3}$ .
19.  $\frac{4}{7} \times \frac{21}{8} = \frac{84}{56} = \frac{3}{2}$ .
20.  $\frac{5}{6} \times \frac{8}{15} = \frac{40}{90} = \frac{4}{9}$ .
21. Divide the total by the size of one batch:  $6 \div \frac{3}{4} = 6 \times \frac{4}{3} = \frac{24}{3} = 8$  batches.
22.  $\frac{3}{4} \div \frac{1}{8} = \frac{3}{4} \times \frac{8}{1} = \frac{24}{4} = 6$  pieces.
23.  $\frac{1}{2} \div \frac{1}{6} = \frac{1}{2} \times \frac{6}{1} = \frac{6}{2} = 3$  cups.
24.  $\frac{7}{8} \div \frac{1}{4} = \frac{7}{8} \times \frac{4}{1} = \frac{28}{8} = \frac{7}{2}$ , or  $3\frac{1}{2}$  sections.



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