Dividing Fractions by Fractions

Name: _____ Date: _____ Score: _____ / 24

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 ÷ to ×, 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 ÷ to ×, and flip $\frac{4}{5}$ to get its reciprocal $\frac{5}{4}$. Now multiply: $\frac{2}{3} \times \frac{5}{4} = \frac{2\times5}{3\times4} = \frac{10}{12}$. 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. $\frac{3}{4} \div \frac{1}{2}$ _____
2. $\frac{1}{2} \div \frac{1}{4}$ _____
3. $\frac{4}{5} \div \frac{2}{5}$ _____
4. $\frac{5}{8} \div \frac{5}{16}$ _____
5. $\frac{3}{8} \div \frac{3}{4}$ _____
6. $\frac{7}{10} \div \frac{7}{10}$ _____
7. $\frac{5}{6} \div \frac{1}{3}$ _____
8. $\frac{9}{10} \div \frac{3}{5}$ _____
9. $\frac{2}{9} \div \frac{1}{3}$ _____
10. $\frac{7}{8} \div \frac{1}{2}$ _____
11. $\frac{4}{9} \div \frac{2}{3}$ _____
12. $\frac{5}{12} \div \frac{5}{6}$ _____
13. $\frac{2}{3} \div \frac{5}{6}$ _____
14. $\frac{3}{5} \div \frac{9}{10}$ _____
15. $\frac{8}{15} \div \frac{4}{5}$ _____
16. $\frac{11}{12} \div \frac{1}{6}$ _____
17. $\frac{7}{12} \div \frac{7}{8}$ _____
18. $\frac{3}{10} \div \frac{9}{20}$ _____
19. $\frac{4}{7} \div \frac{8}{21}$ _____
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? _____

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Answer Keys

1. $\boxed{\frac{3}{2}}$
2. $\boxed{2}$
3. $\boxed{2}$
4. $\boxed{2}$
5. $\boxed{\frac{1}{2}}$
6. $\boxed{1}$
7. $\boxed{\frac{5}{2}}$
8. $\boxed{\frac{3}{2}}$
9. $\boxed{\frac{2}{3}}$
10. $\boxed{\frac{7}{4}}$
11. $\boxed{\frac{2}{3}}$
12. $\boxed{\frac{1}{2}}$
13. $\boxed{\frac{4}{5}}$
14. $\boxed{\frac{2}{3}}$
15. $\boxed{\frac{2}{3}}$
16. $\boxed{\frac{11}{2}}$
17. $\boxed{\frac{2}{3}}$
18. $\boxed{\frac{2}{3}}$
19. $\boxed{\frac{3}{2}}$
20. $\boxed{\frac{4}{9}}$
21. $\boxed{8 \text{ batches}}$
22. $\boxed{6 \text{ pieces}}$
23. $\boxed{3 \text{ cups}}$
24. $\boxed{\frac{7}{2} \text{ sections}}$

Step-by-Step Explanations

1. Keep, change, flip: $\frac{3}{4} \times \frac{2}{1} = \frac{6}{4} = \frac{3}{2}$.
2. $\frac{1}{2} \times \frac{4}{1} = \frac{4}{2} = 2$. Four quarters of a unit, but here just 2 fit into a half.
3. $\frac{4}{5} \times \frac{5}{2} = \frac{20}{10} = 2$. Two groups of $\frac{2}{5}$ fit inside $\frac{4}{5}$.
4. $\frac{5}{8} \times \frac{16}{5} = \frac{80}{40} = 2$.
5. $\frac{3}{8} \times \frac{4}{3} = \frac{12}{24} = \frac{1}{2}$.
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. $\frac{9}{10} \times \frac{5}{3} = \frac{45}{30} = \frac{3}{2}$.
9. $\frac{2}{9} \times \frac{3}{1} = \frac{6}{9} = \frac{2}{3}$.
10. $\frac{7}{8} \times \frac{2}{1} = \frac{14}{8} = \frac{7}{4}$.
11. $\frac{4}{9} \times \frac{3}{2} = \frac{12}{18} = \frac{2}{3}$.
12. $\frac{5}{12} \times \frac{6}{5} = \frac{30}{60} = \frac{1}{2}$.
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. $\frac{8}{15} \times \frac{5}{4} = \frac{40}{60} = \frac{2}{3}$.
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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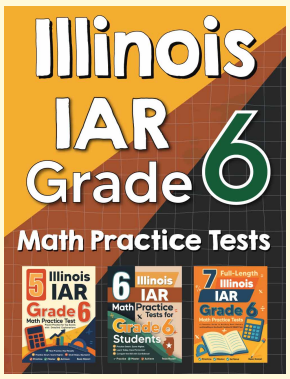

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