

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 \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.

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|-------------------------------------|-------|--------------------------------------|-------|
| 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

<p>1. $\frac{3}{2}$</p> <p>2. 2</p> <p>3. 2</p> <p>4. 2</p> <p>5. $\frac{1}{2}$</p> <p>6. 1</p> <p>7. $\frac{5}{2}$</p> <p>8. $\frac{3}{2}$</p> <p>9. $\frac{2}{3}$</p> <p>10. $\frac{7}{4}$</p> <p>11. $\frac{2}{3}$</p> <p>12. $\frac{1}{2}$</p>	<p>13. $\frac{4}{5}$</p> <p>14. $\frac{2}{3}$</p> <p>15. $\frac{2}{3}$</p> <p>16. $\frac{11}{2}$</p> <p>17. $\frac{2}{3}$</p> <p>18. $\frac{2}{3}$</p> <p>19. $\frac{3}{2}$</p> <p>20. $\frac{4}{9}$</p> <p>21. 8 batches</p> <p>22. 6 pieces</p> <p>23. 3 cups</p> <p>24. $\frac{7}{2}$ sections</p>
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Step-by-Step Explanations

<p>1. Keep, change, flip: $\frac{3}{4} \times \frac{2}{1} = \frac{6}{4} = \frac{3}{2}$.</p> <p>2. $\frac{1}{4} \times \frac{4}{1} = \frac{4}{4} = 1$. Four quarters of a unit, but here just 2 fit into a half.</p> <p>3. $\frac{1}{5} \times \frac{20}{10} = \frac{20}{10} = 2$. Two groups of $\frac{2}{5}$ fit inside $\frac{4}{5}$.</p> <p>4. $\frac{16}{5} \times \frac{5}{80} = \frac{80}{80} = 1$.</p> <p>5. $\frac{4}{3} \times \frac{12}{24} = \frac{12}{24} = \frac{1}{2}$.</p> <p>6. Any number divided by itself is 1 — exactly one group fits.</p> <p>7. $\frac{5}{6} \times \frac{3}{1} = \frac{15}{6} = \frac{5}{2}$.</p> <p>8. $\frac{9}{10} \times \frac{30}{30} = \frac{45}{30} = \frac{3}{2}$.</p> <p>9. $\frac{2}{9} \times \frac{3}{1} = \frac{6}{9} = \frac{2}{3}$.</p> <p>10. $\frac{7}{7} \times \frac{2}{2} = \frac{14}{14} = 1$.</p> <p>11. $\frac{4}{9} \times \frac{3}{3} = \frac{12}{18} = \frac{2}{3}$.</p> <p>12. $\frac{5}{12} \times \frac{6}{6} = \frac{30}{60} = \frac{1}{2}$.</p>	<p>13. $\frac{2}{3} \times \frac{6}{5} = \frac{12}{15} = \frac{4}{5}$.</p> <p>14. $\frac{3}{5} \times \frac{10}{9} = \frac{30}{45} = \frac{2}{3}$.</p> <p>15. $\frac{8}{15} \times \frac{4}{5} = \frac{40}{60} = \frac{2}{3}$.</p> <p>16. $\frac{11}{12} \times \frac{6}{1} = \frac{66}{12} = \frac{11}{2}$.</p> <p>17. $\frac{7}{12} \times \frac{8}{7} = \frac{56}{84} = \frac{2}{3}$.</p> <p>18. $\frac{3}{10} \times \frac{20}{9} = \frac{60}{90} = \frac{2}{3}$.</p> <p>19. $\frac{4}{7} \times \frac{21}{8} = \frac{84}{56} = \frac{3}{2}$.</p> <p>20. $\frac{5}{6} \times \frac{8}{15} = \frac{40}{90} = \frac{4}{9}$.</p> <p>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.</p> <p>22. $\frac{3}{4} \div \frac{1}{8} = \frac{3}{4} \times \frac{8}{1} = \frac{24}{4} = 6$ pieces.</p> <p>23. $\frac{1}{2} \div \frac{1}{6} = \frac{1}{2} \times \frac{6}{1} = \frac{6}{2} = 3$ cups.</p> <p>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.</p>
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