

Dividing fractions



Divide fractions by multiplying by the reciprocal of the divisor, and simplify where you can.

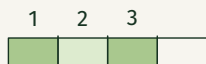
Name _____

Date _____

Flip and multiply

To divide by a fraction, multiply by its reciprocal (flip the numerator and denominator of the second fraction, then multiply straight across). Write a whole number as itself over 1 first. Simplify the result if the numerator and denominator share a common factor.

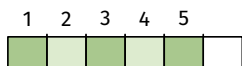
Worked example Find $\frac{3}{4} \div \frac{1}{4}$ using the bar.



How many quarter-tiles fit in $\frac{3}{4}$? 3 tiles fit.

$$\frac{3}{4} \div \frac{1}{4} = 3.$$

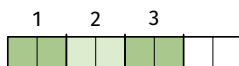
1. How many $\frac{1}{6}$ -tiles fit in $\frac{5}{6}$?



Solution

5 tiles fit.
 $\frac{5}{6} \div \frac{1}{6} = 5.$

2. How many $\frac{2}{8}$ -tiles fit in $\frac{6}{8}$?



Solution

3 tiles fit.
 $\frac{6}{8} \div \frac{2}{8} = 3.$

3. $\frac{1}{2} \div \frac{1}{4}.$

Solution

$$\frac{1}{2} \times \frac{4}{1} = \frac{4}{2} = 2.$$

4. $\frac{2}{3} \div \frac{1}{3}.$

Solution

$$\frac{2}{3} \times \frac{3}{1} = \frac{6}{3} = 2.$$

5. $\frac{5}{6} \div \frac{5}{6}.$

Solution

Dividing a fraction by itself gives 1.

6. $2 \div \frac{1}{2}.$

Solution

$$\frac{2}{1} \times \frac{2}{1} = \frac{4}{1} = 4.$$

7. $\frac{1}{2} \div 2.$

Solution

$$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}.$$

8. $\frac{3}{4} \div \frac{1}{2}.$

Solution

$$\frac{3}{4} \times \frac{2}{1} = \frac{6}{4} = \frac{3}{2} = 1\frac{1}{2}.$$

9. $6 \div \frac{3}{4}.$

Solution

$$\frac{6}{1} \times \frac{4}{3} = \frac{24}{3} = 8.$$

Dividing fractions (continued)



Divide fractions by multiplying by the reciprocal of the divisor, and simplify where you can.

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10. $\frac{3}{5} \div 6$.

Solution

$$\frac{3}{5} \times \frac{1}{6} = \frac{3}{30} = \frac{1}{10}.$$

11. Fill in the blank: $\frac{2}{3} \div \frac{\square}{5} = \frac{10}{9}$.

Solution

$$\frac{2}{3} \times \frac{5}{\square} = \frac{10}{9}, \text{ so } \frac{10}{3\square} = \frac{10}{9} \text{ and } \square = 3.$$

12. Is $\frac{3}{4} \div \frac{1}{2} = \frac{3}{8}$ correct?

Solution

$$\text{No: } \frac{3}{4} \div \frac{1}{2} = \frac{3}{4} \times \frac{2}{1} = \frac{3}{2}, \text{ not } \frac{3}{8}.$$

13. Which is greater: $\frac{3}{4} \div \frac{1}{2}$ or $\frac{3}{4} \times \frac{1}{2}$?

Solution

$$\frac{3}{4} \div \frac{1}{2} = \frac{3}{2}, \frac{3}{4} \times \frac{1}{2} = \frac{3}{8}.$$

The division is greater.

14. Explain in one short sentence why dividing by $\frac{1}{2}$ makes a positive number larger.

Solution

Because $\frac{1}{2}$ is less than 1, so dividing by it doubles the number.

15. A jug is $\frac{3}{4}$ full. Each pour uses $\frac{1}{8}$ of the jug. How many pours is that?

Solution

$$\frac{3}{4} \div \frac{1}{8} = \frac{3}{4} \times \frac{8}{1} = 6 \text{ pours.}$$

16. A student says $\frac{4}{5} \div \frac{2}{3} = \frac{8}{15}$. Are they correct? Explain.

Solution

$$\text{No: } \frac{4}{5} \div \frac{2}{3} = \frac{4}{5} \times \frac{3}{2} = \frac{12}{10} = \frac{6}{5}. \left(\frac{8}{15} \text{ is the product, not the quotient.} \right)$$

17. $1\frac{1}{2} \div \frac{3}{4}$.

Solution

$$1\frac{1}{2} = \frac{3}{2}, \frac{3}{2} \times \frac{4}{3} = \frac{12}{6} = 2.$$

18. Find a fraction so that $\frac{2}{3} \div \square = \frac{10}{9}$.

Solution

$$\square = \frac{2}{3} \div \frac{10}{9} = \frac{2}{3} \times \frac{9}{10} = \frac{18}{30} = \frac{3}{5}.$$