

# Notes

M9

## 1.7 Dividing Fractions

- Dividing fractions is very similar to multiplying fractions. However, there is an important additional step.
- Division is the same as multiplication by a reciprocal. For example: Dividing by two is the same as multiplying by  $\frac{1}{2}$  and dividing by  $\frac{1}{3}$  is the same as multiplying by 3.

Recall: A reciprocal is a flipped fraction.

Write reciprocals for each number:

$-\frac{5}{6}$	$\frac{1}{7}$	$\frac{2}{3}$	$-\frac{9}{17}$	$\frac{8}{1}$
$-\frac{6}{5}$	$\frac{7}{1} = 7$	$\frac{3}{2}$	$\frac{17}{-9} = -\frac{17}{9}$	$\frac{1}{8}$

### Dividing Fractions

To divide fractions, follow these steps:

$$\frac{14}{8} \div \frac{28}{3}$$

1. Reduce each fraction if possible.

$$\frac{\cancel{14}^7}{\cancel{8}_4} \div \frac{28}{3}$$

$$\frac{7}{4} \div \frac{28}{3}$$

2. KeepKissFlip = Copy the first fraction, change division to multiplication, reciprocate the second fraction.

$$\frac{7}{4} \times \frac{3}{28}$$

3. Reduce fractions diagonally if possible.

$$\frac{\cancel{7}^1}{4} \times \frac{3}{\cancel{28}_4} \qquad \frac{1}{4} \times \frac{3}{4}$$

4. Multiply all numerators.

$$1 \times 3 = 3$$

5. Multiply all denominators.

$$4 \times 4 = 16$$

6. Double check that the numerator and denominator do not have a common factor other than 1. Box/circle/underline the final answer.

$$\boxed{\frac{3}{16}}$$

Example: Divide. Remember to show your work and clearly identify the final answer.

1	$\frac{3}{7} \div \frac{2}{14}$	$\frac{3}{7} \div \frac{1}{7} = \frac{3}{7} \times \frac{7}{1} = \frac{3}{1} = \boxed{3}$
2	$\frac{6}{7} \div \frac{15}{21}$	$\frac{6}{7} \div \frac{5}{7} = \frac{6}{7} \times \frac{7}{5} = \boxed{\frac{6}{5}} = \boxed{1\frac{1}{5}}$

3	$\frac{2}{8} \div \frac{12}{9}$ <sub>4</sub> <sup>1</sup> / <sub>3</sub>	$\frac{1}{4} \div \frac{4}{3} = \frac{1}{4} \times \frac{3}{4} = \boxed{\frac{3}{16}}$	
4	$\frac{26}{33} \div \frac{5}{11}$	$\frac{26}{33} \times \frac{11}{5} = \frac{26}{3} \times \frac{1}{5} = \boxed{\frac{26}{15}} = \boxed{1\frac{11}{15}}$	
5	$\frac{7}{10} \div \frac{7}{15} \div \frac{1}{6}$	$\frac{7}{10} \div \frac{7}{15} \div \frac{1}{6} = \frac{7}{10} \times \frac{15}{7} \times \frac{6}{1} = \frac{19}{2} \times \frac{3}{1} \times \frac{6}{1}$ $= \frac{1}{1} \times \frac{3}{1} \times \frac{3}{1} = \boxed{9}$	
6	$\frac{5}{6} \div \frac{3}{5} \div \frac{10}{23}$	$\frac{5}{6} \times \frac{5}{3} \times \frac{23}{10} = \frac{5}{6} \times \frac{1}{3} \times \frac{23}{2}$ $= \boxed{\frac{115}{36}} = \boxed{3\frac{7}{36}}$	
7	$\frac{5}{6} \times \frac{10}{5} \div \frac{32}{8}$	$\frac{5}{2} \times \frac{2}{1} \div \frac{4}{1} = \frac{5}{1} \times \frac{2}{1} \times \frac{1}{4} = \boxed{\frac{5}{4}} = \boxed{1\frac{1}{4}}$	
8	$\frac{7}{8} \div \frac{12}{21} \times \frac{8}{7}$	$\frac{7}{8} \div \frac{4}{7} \times \frac{8}{7} = \frac{7}{8} \times \frac{7}{4} \times \frac{8}{7} = \frac{7}{1} \times \frac{1}{4} \times \frac{1}{1} = \boxed{\frac{7}{4}} = \boxed{1\frac{3}{4}}$	