

Multiplying Fractions and Mixed Numbers

Algorithm

Examples

1. If possible, change any mixed number into an improper fraction.
2. If possible, make any whole number a fraction by putting a 1 for the denominator.
3. Multiply the numerators to get the new numerator.
4. Multiply the denominators to get the new denominator.
5. If possible, reduce/simplify the answer.

Example 1:

$$\frac{4}{5} \times \frac{1}{3} = \frac{4}{15}$$

$$\boxed{\frac{4}{15}}$$

Example 2:

$$8 \times \frac{8}{9} \quad \frac{8}{1} \times \frac{8}{9} = \frac{64}{9} \quad 9 \overline{)64} R1 = \boxed{7\frac{1}{9}}$$

Example 3:

$$4\frac{1}{5} \times \frac{1}{3} \quad \frac{21}{5} \times \frac{1}{3} = \frac{21}{15} \quad 5 \overline{)12} R2 = \boxed{2\frac{2}{5}}$$

Example 4:

$$2\frac{2}{9} \times 5 \quad \frac{20}{9} \times \frac{5}{1} = \frac{100}{9} \quad 9 \overline{)100} R1 = \boxed{11\frac{1}{9}}$$

Always try to cross simplify before multiplying

Dividing Fractions and Mixing Numbers

Algorithm

1. If possible, change any mixed number into an improper fraction.
2. If possible, make any whole number a fraction by putting a 1 for the denominator.
3. **Keep** the first fraction the same.
4. **Switch** division to multiplication.
5. **Flip** the second fraction (this is called the reciprocal).
6. Follow steps #3-5 for multiplying fractions.

Examples

Example 1:

$$\frac{2}{9} \div \frac{1}{3} \quad \frac{\cancel{2}^1}{3} \times \frac{3^1}{1} = \boxed{\frac{2}{3}}$$

Example 2:

$$1\frac{1}{2} \div \frac{1}{2} \quad \frac{3}{2} \div \frac{1}{2}$$

$$\downarrow \quad \downarrow$$

$$\frac{3}{2} \times \frac{2}{1} = \frac{3}{1} = \boxed{3}$$

Example 3:

$$1\frac{3}{5} \div 4 \quad \frac{8}{5} \div 4$$

$$\downarrow \quad \downarrow$$

$$\frac{8}{5} \times \frac{1}{4} = \boxed{\frac{2}{5}}$$

Example 4:

$$5 \div \frac{1}{9} \quad \frac{5}{1} \times \frac{9}{1} = \frac{45}{1} = \boxed{45}$$

$$\downarrow$$

$$\frac{5}{1}$$