



Reducing Fractions to Lowest Terms

METHOD 1 – Prime Factoring

Reduce $\frac{36}{60}$ to lowest terms.

- Factor the numerator and denominator into prime factors.

$$\begin{array}{r} 36 \\ \swarrow \searrow \\ 2 \cdot 18 \\ \swarrow \searrow \\ 2 \cdot 9 \\ \swarrow \searrow \\ 3 \cdot 3 \end{array}$$

$$\begin{array}{r} 60 \\ \swarrow \searrow \\ 2 \cdot 30 \\ \swarrow \searrow \\ 2 \cdot 15 \\ \swarrow \searrow \\ 3 \cdot 5 \end{array}$$

$$\frac{36}{60} = \frac{2 \cdot 2 \cdot 3 \cdot 3}{2 \cdot 2 \cdot 3 \cdot 5}$$

- Cancel common factors in numerator and denominator, and multiply the remaining factors.

$$\frac{\cancel{2} \cdot \cancel{2} \cdot \cancel{3} \cdot 3}{\cancel{2} \cdot \cancel{2} \cdot \cancel{3} \cdot 5} = \frac{3}{5}$$

METHOD 2 – Divisibility

Reduce $\frac{36}{60}$ to lowest terms.

- Using the divisibility hints on sheet 2, check for the even divisibility of prime numbers into **both the numerator and denominator**. Since 2 divides into **both** 36 & 60 evenly:

$$\frac{36 \div 2}{60 \div 2} = \frac{18}{30}$$

- Continue using the divisibility rules. Since 2 divides into **both** 18 & 30 evenly:

$$\frac{18 \div 2}{30 \div 2} = \frac{9}{15}$$

- Finally, since 3 divides into **both** 9 & 15 evenly:

$$\frac{9 \div 3}{15 \div 3} = \frac{3}{5}$$

There are no remaining common prime factors, so the final answer is $\frac{3}{5}$.



Reducing Fractions to Lowest Terms

HINTS FOR DIVISIBILITY OF SOME COMMON PRIME FACTORS*

		Example		
Check the last digit	If even (0,2,4,6,8) Then number is divisible by 2	76	6 is even	$\frac{38}{2} = 19$
Add all digits	If the sum is divisible by 3 The number is divisible by 3	123	1+2+3=6 6 is divisible by 3	$\frac{123}{3} = 41$
Is the last digit 0 or 5?	The number is divisible by 5	415	Last digit is 5	$\frac{415}{5} = 83$
Are all of the digits the same?	If there is an even number of digits, the number is divisible by 11 .	66	All digits are the same, and there are an even number of digits.	$\frac{66}{11} = 6$
Add up every other digit.	If the sums are the same, the number is divisible by 11 .	253	2+3=5 5=5	$\frac{253}{11} = 23$

* A separate help sheet lists a complete explanation of Divisibility Rules

Now, try the practice problems below.

PRACTICE PROBLEMS: Reduce the following fractions to lowest terms.

1. $\frac{20}{36} =$

6. $\frac{30}{42} =$

2. $\frac{42}{66} =$

7. $\frac{51}{85} =$

3. $\frac{24}{40} =$

8. $\frac{27}{66} =$

4. $\frac{14}{98} =$

9. $\frac{102}{114} =$

5. $\frac{70}{90} =$

10. $\frac{75}{110} =$

Answers

- $\frac{5}{9}$
- $\frac{7}{11}$
- $\frac{3}{5}$
- $\frac{1}{7}$
- $\frac{7}{9}$
- $\frac{5}{7}$
- $\frac{3}{5}$
- $\frac{9}{20}$
- $\frac{17}{19}$
- $\frac{15}{22}$