Reducing Fractions to Lowest Terms

METHOD 1 – Prime Factoring

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

- Factor the numerator and denominator into prime factors.

36	60
↙ ↘	↙ ↘
2 · 18	**2** · 30
↙ ↘	↙ ↘
2 · 9	**2** · 15
↙ ↘	↙ ↘
3 · **3**	**3** · **5**

$$\frac{36}{60}=\frac{2\cdot2\cdot3\cdot3}{2\cdot2\cdot3\cdot5}$$

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

$$\frac{\cancel{2}\cdot\cancel{2}\cdot\cancel{3}\cdot3}{\cancel{2}\cdot\cancel{2}\cdot\cancel{3}\cdot5}=\frac{3}{5}$$

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:

$$\frac{36\div2}{60\div2}=\frac{18}{30}$$

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

$$\frac{18\div2}{30\div2}=\frac{9}{15}$$

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

$$\frac{9\div3}{15\div3}=\frac{3}{5}$$

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

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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. $\frac{20}{36}=$
2. $\frac{42}{66}=$
3. $\frac{24}{40}=$
4. $\frac{14}{98}=$
5. $\frac{70}{90}=$
6. $\frac{30}{42}=$
7. $\frac{51}{85}=$
8. $\frac{27}{66}=$
9. $\frac{102}{114}=$
10. $\frac{75}{110}=$

Answers

1. $\frac{5}{9}$
2. $\frac{7}{11}$
3. $\frac{3}{5}$
4. $\frac{1}{7}$
5. $\frac{7}{9}$
6. $\frac{5}{7}$
7. $\frac{3}{5}$
8. $\frac{9}{20}$
9. $\frac{17}{19}$
10. $\frac{15}{22}$

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