

Step-by-step
in plain English

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St. Petersburg Times

MATH and STATISTICS
TOOLBOX
RECIPE CARDS

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- [Percent](#)
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- [Timed Math Drills \(test your mettle\)](#)
Note: electronic only

DETAIL SHEETS

- [Order of operations](#)
- [Terminology and math style](#)

COMING
ATTRACTIONS

- More percent questions including: markdown (decrease), markup (increase), percent of total and percent change
- Millage rates
- Percent and percentage points
- Currency exchange rates
- Mean, median & mode
- Metric conversions
- Consumer Price Index

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Reducing a fraction

DETAIL SHEET:

How a fraction
is written:

$$\frac{3}{5}$$

$$\frac{3}{5} \text{ numerator}$$

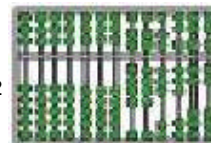
$$\text{denominator}$$



Definition: Rename as an *equivalent* or *proportional** fraction with smaller numbers. To do this, divide the top or left number (numerator) and bottom or right number (denominator) **evenly** by the same value. **Note:** Fractions are generally not the correct style for use in news copy but we will use this number form in order to perform certain math calculations. (* equivalent means the same as proportional)

Common Illustration: The following fractions are equivalent:
 $\frac{1}{2}$ and $\frac{50}{100}$

In this case, $50/100$ divided by $50/50 = 1/2$



Classic math question: Where to start?

Is there a shortcut for finding a number that can be evenly divided into the numerator and denominator? There is no one shortcut but there are six brief questions that will help you determine if a fraction can be reduced:

Questions to ask when reducing a fraction:

1. **Are both numbers even?**
Divide by 2 or a multiple of 2.
2. **Do both numbers end in 0 (zero)?**
Divide by 10 or a multiple of 10.
3. **Do both numbers end in 5?**
Divide by 5 or a multiple of 5.
4. **Does one number end in 0 (zero) and the other end in 5?**
Divide by 5 or a multiple of 5.
5. **Do the individual digits in each number (the numerator and denominator) add up to 9 or a multiple of 9?**
(Example: $45 = 4+5 = 9$)
Divide by 9 or a multiple of 9.
6. **Do the individual digits in both numbers add up to 3 or a factor of 3?**
Divide by 3 or a multiple of 3.

Example (A)

$\frac{45}{75}$ (see Q. 3)
the numerator and denominator both end in 5; **divide each by 5:**

$$\frac{45}{75} \div \frac{5}{5} = \frac{9}{15}$$

$\frac{9}{15}$ (see Q. 6)
the individual digits in the numerator and denominator add up to a multiple of 3; **divide each by 3:**

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

So, $\frac{45}{75}$ and $\frac{3}{5}$ are equivalent.

Checking your math:

Equivalent fractions have the same decimal and percent values. So, to check if two fractions are equivalent, calculate their decimal values by dividing the numerator by the denominator:

$$\frac{45}{75} = 0.6 \text{ and } \frac{3}{5} = 0.6 \quad \text{Bingo, it checks out!}$$


Now, multiply the decimal 0.6 by 100 to get the equivalent percent:
 $0.6 \times 100 = 60/100$ So, $\frac{3}{5}$ and $\frac{45}{75}$ share the same percent: 60 percent

More about proportion:

In the above example: "3 is to 5 as 45 is to 75." This relationship allows you to find an "unknown" number. See the "Two classic percent questions" card.

Practical story example (B):

Generalizing to simplify --

 You are assigned to cover a meeting where a crowd has gathered to hear about a proposed 15 percent increase in property taxes -- a record amount. You estimate that 50 out of the 100 people in the audience are angry homeowners. (An intern attending the meeting with you actually does a poll of the audience: 47 homeowners; 49 students and 6 teachers.) Simplify your lead and make the decision that $47/102$ and $55/102$ are both roughly equivalent to $50/100$.

Step 1. $50/100$ can be reduced by dividing the numerator and denominator by 10 (see Question 2, above) to get $5/10$

Step 2. $5/10$ can be reduced by dividing the numerator and denominator by 5 (see Question 4, above) to get $1/2$. In news copy, $1/2$ would be referred to as "one half" or "a half" or just "half."

It is accurate to generalize a bit and say: *Homeowners angry over a proposed record increase in property taxes made up half the crowd of 100 at the city council meeting last night. The other half were grammar school students and their teachers getting a lesson in local government.*

Including the intern's specific poll data would also be accurate but some journalists would say the copy would contain unnecessary detail and number clutter: *Homeowners angry over a proposed record 15 percent increase in property taxes numbered 47 out of a crowd of 102. Also in the audience were 49 grammar school students and 6 teachers on a field trip to learn about local government.*