

Numerator

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Denominator

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Equivalent fractions

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How do you make an equivalent fraction?

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Simplify a fraction

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Highest common factor (HCF)

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Lowest terms

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Improper fraction

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the denominator of a fraction: how many equal parts the whole is cut into



the numerator of a fraction: how many parts you have



multiply or divide the numerator and the denominator by the same number: $\frac{2}{3} \times (\frac{2}{2}) = \frac{4}{6}$



fractions that show the same amount with different sized pieces, e.g. $\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$



the biggest number that divides exactly into both the numerator and the denominator



divide the numerator and denominator by their highest common factor: $\frac{12}{18} \div (\frac{6}{6}) = \frac{2}{3}$



the numerator is bigger than the denominator, so it is more than one whole, e.g. $\frac{7}{4}$



a fraction that cannot be simplified any more, e.g. $\frac{2}{3}$



Mixed numeral

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Improper fraction to mixed numeral

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Mixed numeral to improper fraction

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Common denominator

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Compare fractions

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Add and subtract fractions

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Why is $\frac{1}{2} + \frac{1}{3}$ not $\frac{2}{5}$?

Multiply fractions

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divide the numerator by the denominator: the answer is the whole number and the remainder is the new numerator. $\frac{17}{5} = 3\frac{2}{5}$

a whole number and a fraction together, e.g.

$$1\frac{3}{4}$$

a denominator that is the same for each fraction, so the pieces are the same size and can be counted or compared

whole number $\times$ denominator + numerator, over the same denominator. $2\frac{1}{3} = \frac{3 \times 2 + 1}{3} =$

$$\frac{7}{3}$$

make a common denominator, then add or subtract the numerators only. $\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$

change them to the same denominator first, then compare the numerators. $\frac{3}{4} = \frac{9}{12}$ and $\frac{2}{3} = \frac{8}{12}$, so $\frac{3}{4}$ is bigger

numerator $\times$ numerator and denominator $\times$ denominator (cancel first if you can). $\frac{2}{3} \times \frac{3}{4} = \frac{6}{12} = \frac{1}{2}$

the pieces are different sizes, so you must make a common denominator first. Never add the denominators

Area model for multiplying

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Reciprocal

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Divide by a fraction

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Dividing: how many fit?

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Operations with mixed numerals

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Percentage

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Fraction to decimal

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Decimal to percentage

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the fraction flipped upside down. The reciprocal of $\frac{5}{6}$ is $\frac{6}{5}$



shade rows for one fraction and columns for the other: the overlap shows the product. $\frac{2}{3} \times \frac{3}{4} = 6$ of 12 pieces



$3 \div \frac{1}{4}$ asks how many quarters fit in 3. There are 4 in each whole, so 12



multiply by the reciprocal. $3 \div \frac{1}{4} = 3 \times 4 = 12$



a fraction out of 100. Per cent means per hundred



change to improper fractions first. $2\frac{1}{2} \div \frac{5}{6} = \frac{5}{2} \times \frac{6}{5} = \frac{30}{10} = 3$



multiply by 100. $0.75 \times 100 = 75\%$



divide the numerator by the denominator. $\frac{3}{4}$ means $3 \div 4 = 0.75$



Percentage to decimal

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Percentage to fraction

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Terminating decimal

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Recurring decimal

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Which fractions give terminating
decimals?

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$\frac{1}{2}$, $\frac{1}{4}$ and $\frac{3}{4}$ as decimals and
percentages

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$\frac{1}{5}$, $\frac{1}{10}$ and $\frac{1}{8}$ as decimals and
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Order fractions, decimals and
percentages

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write it over 100 and simplify. $75\% = \frac{75}{100} = \frac{3}{4}$

divide by 100. $75\% \div 100 = 0.75$

a decimal whose digits repeat for ever, e.g.
 $\frac{1}{3} = 0.333\ldots$ (write a dot over the repeating digit)

a decimal that ends, e.g. $\frac{1}{8} = 0.125$

$0.5 = 50\%$, $0.25 = 25\%$ and $0.75 = 75\%$

a fraction in lowest terms terminates only if its denominator has no prime factors other than 2 and 5

change everything to the same form (often percentages), then order them. $\frac{7}{8} = 87.5\%$,
 $0.85 = 85\%$, 82%

$0.2 = 20\%$, $0.1 = 10\%$ and $0.125 = 12.5\%$

Find a percentage of an amount

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Multiplier

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Multiplier for an increase

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Multiplier for a decrease

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Why 1.2 and not 0.2 for a 20% rise?

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Increase 45 by 20%

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Decrease 300 by 15%

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Repeated percentage change

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the number you multiply by to apply a percentage change in one step



change the percentage to a decimal and multiply. $25\% \text{ of } 80 = 0.25 \times 80 = 20$



1 – the fall as a decimal. A 20% fall is $\times 0.8$
and a 15% fall is $\times 0.85$



1 + the rise as a decimal. A 20% rise is $\times 1.2$
and a 5% rise is $\times 1.05$



$$45 \times 1.2 = 54$$



the original is 100%, and $100\% + 20\% = 120\% = 1.2$. Multiplying by 0.2 would give only a fifth of the original



multiply the multipliers. +20% then –20% is
 $1.2 \times 0.8 = 0.96$, which is 4% less than the start



$$300 \times 0.85 = 255$$



**Why is up 20% then down 20%
not back to the start?**

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The original is always...

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**Check a percentage
answer**

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Discount

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100%. A percentage change always refers to the original amount



each percentage refers to a different whole:
20% of 100 is 20 but 20% of 120 is 24



a reduction in price, worked out as a percentage decrease. 25% off 40 francs = $40 \times 0.75 = 30$ francs



estimate first. A 20% rise on 45 is about a fifth more, which is 9, so 54 makes sense

