Grade 6 · Adding, Subtracting, Multiplying and Dividing Decimals · Lesson

Common Core 6.NS.B.3 · mathovore.fr

> Decimal operations use the same algorithms as whole numbers, with extra care for the decimal point. To add or subtract, line up the decimal points. To multiply, count the decimal places in both factors. To divide, move the decimal point in the divisor and dividend until the divisor is a whole number.

Grade 6Common Core: 6.NS.B.3

> **Key facts:**
>
> - Line up decimal points before adding or subtracting, and fill gaps with zeros.
> - The number of decimal places in a product equals the total in its factors.
> - Dividing by a decimal: multiply dividend and divisor by the same power of 10.
> - Dividing by a number less than 1 gives a quotient greater than the dividend.
> - Estimate with rounded numbers to check that the decimal point is in the right place.

How do you add and subtract decimals?

Line up the decimal points so that digits with the same place value sit in the same column. Fill any gaps with zeros, then add or subtract as with whole numbers and bring the decimal point straight down. For example, $6.3+2.85$ becomes $6.30+2.85=9.15$.

$$\begin{array}{r} 6.30 \\ +\ 2.85 \\ \hline 9.15 \end{array}$$

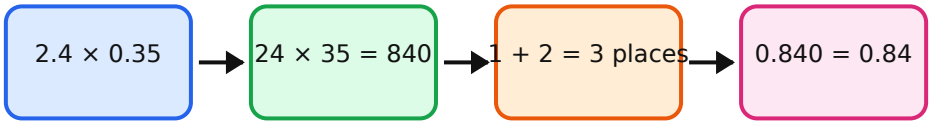
Line up the decimal points (shaded column).

How do you multiply decimals?

Ignore the decimal points and multiply as if the factors were whole numbers. Then count the total number of decimal places in both factors and place that many decimal places in the

product.

Multiplying decimals
To find 2.4×0.35: multiply $24 \times 35 = 840$. The factors have $1 + 2 = 3$ decimal places, so the product is $0.840 = 0.84$.



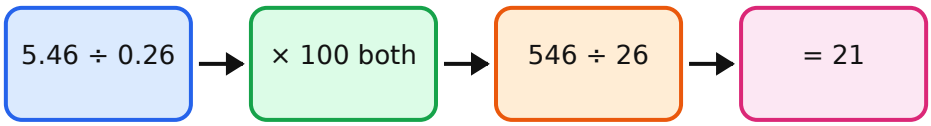
Multiply as whole numbers, then count decimal places.

How do you divide decimals?

Dividing by a decimal is easier after you turn the divisor into a whole number. Multiplying both the dividend and the divisor by the same power of 10 does not change the quotient, so the decimal point can move in both numbers together.

1. Write the problem $5.46 \div 0.26$.
2. Count the decimal places in the divisor: 0.26 has 2 places, so multiply both numbers by 100.
3. The problem becomes $546 \div 26$.
4. Divide with the long division algorithm: 26 goes into 54 twice (52), leaving 2. Bring down 6 to get 26, and 26 goes in once. The quotient is 21.
5. Check by multiplying: $0.26 \times 21 = 5.46$.

When the divisor is already a whole number, such as $46.8 \div 12$, divide normally and place the decimal point in the quotient directly above the decimal point in the dividend.

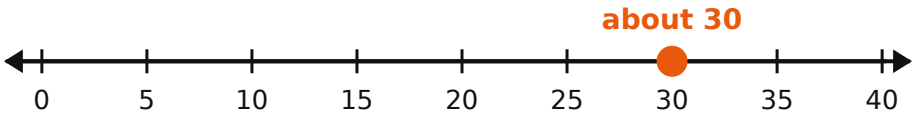


Move both decimal points the same number of places.

How do you place the decimal point correctly?

Operation	Where the decimal point goes
Add or subtract	Line up the decimal points; the answer keeps that column
Multiply	Total decimal places in the factors equals decimal places in the product

Operation	Where the decimal point goes
Divide	Move the divisor and dividend points together until the divisor is whole



Estimate: 4.87×6.12 is about $5 \times 6 = 30$.

How can you check that an answer is reasonable?

Round each number to a friendly value first. For 4.87×6.12, think $5 \times 6 = 30$. An answer of 2.98 or 298 would not be reasonable, so the decimal point was misplaced.

Adding, Subtracting, Multiplying and Dividing Decimals: frequently asked questions

Why do you line up decimal points when adding?

Digits must have the same place value before they can be added. Lining up the decimal points puts tenths with tenths and hundredths with hundredths.

How many decimal places does a product have?

Add the number of decimal places in the two factors. For example, 1.2 and 0.05 have $1 + 2 = 3$ places, so the product of 12 and 5 becomes 0.060, which is 0.06.

Why can you move the decimal point in both numbers when dividing?

Multiplying the dividend and the divisor by the same power of 10 gives an equivalent division with the same quotient. It turns the divisor into a whole number.

Can the quotient of two decimals be larger than the dividend?

Yes. Dividing by a number smaller than 1 makes the result larger. For example, $4.5 \div 0.05 = 90$.

What do you do when you subtract and the top number has fewer decimal places?

Write extra zeros on the right of the top number. For $20.3 - 7.84$, write 20.30 first. This does not change the value.