

Decimal Operations: Add, Subtract, Multiply, Divide

Grade 6 math · Lesson · Standards: 6.NS.B.3

Quick answer: To add or subtract decimals, line up the decimal points. To multiply, ignore the points, multiply, then give the product as many decimal places as both factors have. To divide by a decimal, multiply both numbers by a power of 10 so the divisor is whole.

Standards: 6.NS.B.3 · **Level:** Grade 6

How do you add and subtract decimals?

Method

1. Line up the decimal points, one under the other.
2. Fill empty places with zeros.
3. Add or subtract as with whole numbers.
4. Bring the decimal point straight down into the answer.

Worked example

Find $14.7 + 3.85$. Write 14.70 and 3.85 in columns: the hundredths give $0 + 5 = 5$, the tenths $7 + 8 = 15$, and so on.

Answer: **18.55**.

$$\begin{array}{r}
 14.70 \\
 + \quad 3.85 \\
 \hline
 18.55
 \end{array}$$

Line up the decimal points and fill empty places with zeros.

How do you multiply decimals?

Multiply as if there were no decimal points, then give the product as many decimal places as the two factors have together.



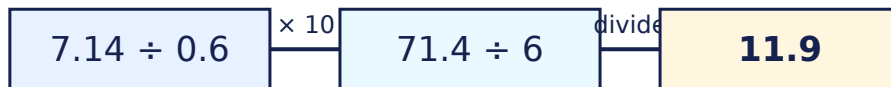
1 decimal place + 1 decimal place = 2 places in the product

Multiply as whole numbers, then place the decimal point.

For 2.4×1.5 , $24 \times 15 = 360$. The factors have $1 + 1 = 2$ decimal places, so the product is $3.60 = 3.6$.

How do you divide decimals?

When the divisor is a decimal, multiply the divisor and the dividend by the same power of 10 so the divisor becomes a whole number. Then divide as usual and keep the decimal point above the one in the dividend.



Multiply both numbers by 10 so the divisor is a whole number

Moving the decimal point in both numbers keeps the quotient.

For $7.14 \div 0.6$, multiply both by 10 to get $71.4 \div 6 = 11.9$. If a division does not end, add zeros after the decimal point and keep dividing.

How do you check where the decimal point goes?

Operation	Rule	Example
Add or subtract	align the points	$20 - 7.35 = 12.65$
Multiply	count places in both factors	$0.08 \times 0.9 = 0.072$
Divide	make the divisor whole	$0.96 \div 0.08 = 12$

Estimate with rounded numbers: 2.4×1.5 is about $2 \times 1.5 = 3$, so 3.6 is reasonable and 36 or 0.36 is not.

Common mistake

Lining up the last digits instead of the decimal points. In $3.7 + 12.45$, the 7 is in the tenths place and must sit above the 4.

Mathbot's tip

Use money to check decimals: \$0.25 times 4 is \$1.00, so $0.25 \times 4 = 1$. If your answer would not make sense as dollars and cents, look again.

Key points to remember

- Add and subtract by aligning decimal points and filling zeros.
- Multiply as whole numbers, then count the decimal places in both factors.
- To divide by a decimal, make the divisor a whole number first.
- Estimate to check where the decimal point belongs.
- Money problems are a quick reasonableness check.

Decimal Operations: Add, Subtract, Multiply, Divide: frequently asked questions

How do you add decimals?

Line up the decimal points, fill empty places with zeros, and add as with whole numbers. Bring the decimal point straight down into the sum.

How do you know where to put the decimal point when multiplying?

Count the decimal places in both factors and give the product that many places. For 2.4×1.5 there are two, so 360 becomes 3.60.

How do you divide by a decimal?

Multiply the divisor and the dividend by the same power of 10 until the divisor is a whole number. Then divide normally, so $7.14 \div 0.6$ becomes $71.4 \div 6$.

What if a decimal division does not come out even?

Add zeros after the decimal point in the dividend and keep dividing. For example, $7 \div 8$ becomes $7.000 \div 8 = 0.875$.

How can estimating help with decimals?

Round each number to a friendly value and compute. Since 2.4×1.5 is close to $2 \times 1.5 = 3$, an answer of 3.6 is reasonable but 36 is not.