

DECIMAL BASICS

PRAXIS FLASHCARD #269

DECIMAL POINT

A **decimal point** is a period that indicates the location of the one's place – the decimal point always comes to the right of the one's place. If there are no fractional decimal numbers to the right of the decimal point, the decimal point doesn't have to be written. It is understood.



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COMPARING DECIMAL NUMBERS

Line up the **decimal numbers** according to place value (as though you were going to add them). Starting at the left-most place value, **compare** the numbers in each place value to find the largest, next largest, etc.

0.74
0.77
0.76

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DECIMAL NUMBER ADDITION

Decimal numbers are added exactly the same as whole numbers: line up the numbers by place value and add each place value from the right to the left. When the decimal numbers are lined up by place value properly, the decimal points in each number are also lined up. Any number without a decimal point is lined up so the ones place is right before the decimal point (there is an understood decimal point after the one's place). It may help to write zeros in empty places to facilitate addition.

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DECIMAL NUMBER SUBTRACTION

Decimal numbers are subtracted exactly the same as whole numbers: line up the numbers by place value and subtract each place value from the right to the left.

When the decimal numbers are lined up by place value properly, the decimal points in each number are also lined up. Any number without a decimal point is lined up so the ones place is right before the decimal point (there is an understood decimal point after the ones place). It may help to write zeros in empty places to facilitate subtraction.

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DECIMAL NUMBER MULTIPLICATION

Decimal numbers are multiplied by temporarily ignoring the decimal point. Multiply the two numbers as though they were whole numbers. In the final product, place the decimal point to signify the number of decimal places in both numbers of the original problem.

For example: 2.3 (one decimal place) x 1.456 (three decimal places) is the same as 23 x 1456 with the answer having four decimal places (1 + 3 from the original problem)

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DECIMAL NUMBER DIVISION

Division is not defined for decimal numbers. In order to divide by a decimal number, we change that divisor into a whole number: First multiply each number by powers of 10 – multiply by whatever is necessary to make the divisor a whole number. Then divide as you would with whole numbers. Wherever the decimal point is in the dividend, it floats directly up to that position in the quotient (answer).

$$6.625 \div 0.53 \rightarrow 662.5 \div 53$$

The diagram shows the equation $6.625 \div 0.53 \rightarrow 662.5 \div 53$. Blue arrows point from the decimal point in 0.53 to the decimal point in 662.5, and from the decimal point in 6.625 to the decimal point in 662.5.

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MULTIPLYING BY POWERS OF 10

Because we use a Base 10 number system, each place value is 10 times the place value to its right. As such, **multiplying by powers of 10** is simply a matter of moving the decimal point to the right (one place for each power of 10).

$$\text{Example: } 123.456 \times 10^2 = 123.456 \times 100 = 12345.6$$

In this example, we were multiplying by 10 to the power of 2, which is a 1 followed by 2 zeroes, so we merely move the decimal point 2 places to the right.

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DIVIDING BY POWERS OF 10

Because we use a Base 10 number system, each place value is 10 times the place value to its right. As such, **dividing by powers of 10** is simply a matter of moving the decimal point to the left (one place for each power of 10).

$$\text{Example: } 123.456 \div 10^2 = 123.456 \div 100 = 1.23456$$

In this example, we were dividing by 10 to the power of 2, which is a 1 followed by 2 zeroes, so we merely move the decimal point 2 places to the left.

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SCIENTIFIC NOTATION

Scientific Notation is a way to write very large or very small numbers using powers of 10. To convert a number into scientific notation, move the decimal point so the resulting number is between 1 and 10. Then state the power of 10.

Because we use a Base 10 number system, an easy way to know what power of 10 is needed, **the exponent indicates the number of decimal places the decimal point was moved**. The exponent is negative if the decimal point was moved to the right; the exponent is positive if the decimal point was moved to the left.

$$\text{Example: } 1234.5 \rightarrow 1.2345 \times 10^3$$
