

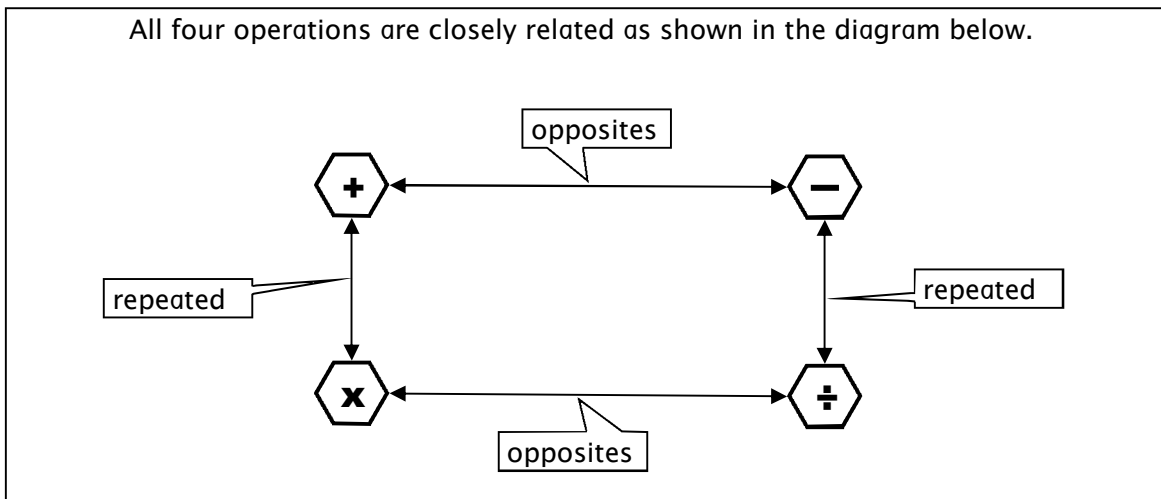
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The Four Operations

The Four Operations and their signs.

<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">Addition +</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">Subtraction —</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">Multiplication x</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">Division ÷</td> </tr> </table> <p style="margin-top: 10px;"><i>The answers are called:</i></p> <table style="width: 100%; text-align: center;"> <tr> <td>$3 + 4 = 7$ sum</td> <td>$7 - 5 = 2$ difference</td> <td>$3 \times 2 = 6$ product</td> </tr> <tr> <td></td> <td>$6 \div 2 = 3$ quotient</td> <td></td> </tr> </table>	Addition +	Subtraction —	Multiplication x	Division ÷	$3 + 4 = 7$ sum	$7 - 5 = 2$ difference	$3 \times 2 = 6$ product		$6 \div 2 = 3$ quotient		<p>There are two ways of setting out the operations, horizontal and vertical.</p> <p><i>Horizontal form</i></p> <table style="width: 100%; text-align: center;"> <tr> <td>$3 + 4 = 7$</td> <td>$7 - 5 = 2$</td> <td>$3 \times 2 = 6$</td> </tr> <tr> <td></td> <td>$6 \div 2 = 3$</td> <td></td> </tr> </table> <p><i>Vertical form</i></p> <table style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;"> $\begin{array}{r} 3 \\ + 4 \\ \hline 7 \end{array}$ </td> <td style="width: 50%;"> $\begin{array}{r} 7 \\ - 5 \\ \hline 2 \end{array}$ </td> </tr> <tr> <td> $\begin{array}{r} 3 \\ \times 4 \\ \hline 7 \end{array}$ </td> <td> $\begin{array}{r} 3 \\ 2 \overline{)6} \end{array}$ </td> </tr> </table>	$3 + 4 = 7$	$7 - 5 = 2$	$3 \times 2 = 6$		$6 \div 2 = 3$		$\begin{array}{r} 3 \\ + 4 \\ \hline 7 \end{array}$	$\begin{array}{r} 7 \\ - 5 \\ \hline 2 \end{array}$	$\begin{array}{r} 3 \\ \times 4 \\ \hline 7 \end{array}$	$\begin{array}{r} 3 \\ 2 \overline{)6} \end{array}$
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Addition is the process of putting numbers together to find out how many are there altogether.

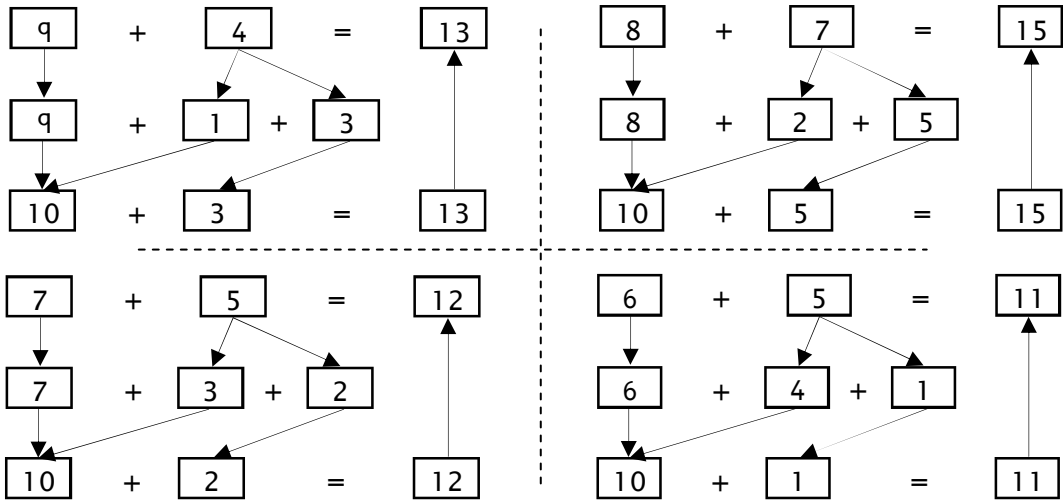
Subtraction is the opposite process, taking away one number from another to find the difference.

Multiplication is a shorter way of repeated addition.

Division is the inverse of multiplication. Division could be explained as repeated subtraction.

Adding single digit numbers with answers larger than 10.

The method is based on: $9 + 1 = 10$, $8 + 2 = 10$, $7 + 3 = 10$, $6 + 4 = 10$.



Using doubles and near doubles.

Learn and memorise **doubles**.

$2 + 2 = 4$

$5 + 5 = 10$

$8 + 8 = 16$

$3 + 3 = 6$

$6 + 6 = 12$

$9 + 9 = 18$

$4 + 4 = 8$

$7 + 7 = 14$

$10 + 10 = 20$

Spot the **doubles** and use them to simplify the addition.

$3 + 4 = 7$

$6 + 8 = 14$

$(3 + 3) + 1 = 7$

$(6 + 6) + 2 = 14$

$4 + 5 = 9$

$7 + 9 = 16$

$(4 + 4) + 1 = 9$

$(7 + 7) + 2 = 16$

Partitioning - splitting numbers into tens and ones.

$$\begin{array}{c} 7 \\ \swarrow \quad \searrow \\ 34 + 23 = \\ \swarrow \quad \searrow \\ 50 \end{array}$$

$$\begin{array}{c} 30 + 20 + 4 + 3 \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ 50 \quad + \quad 7 = 57 \end{array}$$

$$\begin{array}{l} 45 + 32 = \\ 40 + 30 + 5 + 2 \\ 70 + 7 = 77 \end{array}$$

$$\begin{array}{l} 75 + 24 = \\ 90 + 9 = 99 \end{array}$$

Subtraction methods.

There are 3 easy ways to work out differences like this: 56 - 9

1st way $56 - 6 - 3 = 47$

2nd way $56 - 10 + 1 = 47$

3rd way

$$\begin{array}{r} 4 \text{ } 16 \\ \cancel{5} \text{ } 6 \\ - 9 \\ \hline 47 \end{array}$$

Subtracting multiples of 10 from multi digit numbers.

Compensation strategy.

$$\begin{array}{c} 90 \\ \swarrow \quad \searrow \\ 100 - 10 \end{array}$$

$450 - 90 = 450 - 100 + 10 = 360$

$345 - 80 = 345 - 100 + 20 = 265$

$$\begin{array}{c} 80 \\ \swarrow \quad \searrow \\ 100 - 20 \end{array}$$

$625 - 70 = 625 - 100 + 30 = 555$

$532 - 60 = 532 - 100 + 40 = 472$

$$\begin{array}{c} 70 \\ \swarrow \quad \searrow \\ 100 - 30 \end{array}$$

$$\begin{array}{c} 60 \\ \swarrow \quad \searrow \\ 100 - 40 \end{array}$$

Relationship between addition and subtraction.

$$\begin{array}{l} 8 + 5 = 13 \\ 13 - 8 = 5 \\ 13 - 5 = 8 \end{array}$$

$$\begin{array}{l} 9 + 7 = 16 \\ 16 - 9 = 7 \\ 16 - 7 = 9 \end{array}$$

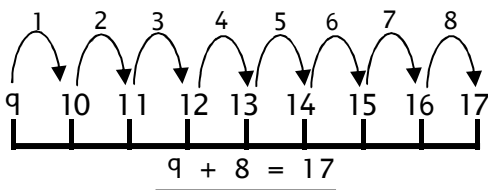
How much more or less?

To work out problems such as

Sue has \$9, Helen has \$17.
How much more has Helen?

Set out $\boxed{\$9} + \boxed{} = \17

Work out



or

$$\begin{array}{l} 17 - 9 = \\ 17 - 10 + 1 = \\ \underline{\underline{7 + 1 = 8}} \end{array}$$

or

$$\begin{array}{l} 17 - 9 = \\ 17 - 7 - 2 = \\ \underline{\underline{10 - 2 = 8}} \end{array}$$

Counting on in multiples using a number track.

Mark the multiples using fingers, counters, crosses, circles etc.

Writing multiples on number lines.

Counting on in multiples using cards.

Using a line of multiples for division.

$$6 \overline{)13} \begin{array}{r} 2 \ 2 \ 4 \\ 3 \ 1 \ 4 \ 2 \ 4 \end{array} \qquad \begin{array}{r} 6 \ 12 \ 18 \ 24 \\ \underline{ } \\ 2 \\ 4 \end{array}$$

Remainders: $12 + \boxed{1} = 13$
 $12 + \boxed{2} = 14$

$$3 \overline{)21} \begin{array}{r} 7 \ 5 \ 9 \\ 2 \ 1 \ 7 \ 2 \ 7 \end{array} \qquad \begin{array}{r} 3 \ 6 \ 9 \ 12 \ 15 \ 18 \ 21 \ 24 \ 27 \\ \underline{ } \\ 5 \\ 7 \\ 9 \end{array}$$

Remainders: $21 + \boxed{1} = 22$
 $15 + \boxed{2} = 17$

$$4 \overline{)28} \begin{array}{r} 7 \ 3 \ 8 \ r2 \\ 2 \ 9 \ 1 \ 5 \ 3 \ 4 \ 2 \end{array} \qquad \begin{array}{r} 4 \ 8 \ 12 \ 16 \ 20 \ 24 \ 28 \ 32 \\ \underline{ } \\ 3 \\ 7 \\ 8 \end{array}$$

Remainders: $28 + \boxed{1} = 29$
 $12 + \boxed{3} = 15$
 $32 + \boxed{2} = 34$

$$12 \overline{)48} \begin{array}{r} 4 \ 1 \ 3 \ 0 \ r2 \\ 4 \ 1 \ 5 \ 3 \ 6 \ 2 \ 2 \end{array} \qquad \begin{array}{r} 12 \ 24 \ 36 \ 48 \\ \underline{ } \\ 1 \\ 3 \\ 4 \end{array}$$

Remainders: $48 + \boxed{1} = 49$
 $12 + \boxed{3} = 15$

Division by 2 digits.

$$12 \overline{)204} \begin{array}{r} 1 \ 7 \\ -1 \ 2 \\ \hline 8 \ 4 \end{array} \qquad \begin{array}{r} 12 \ 24 \ 36 \ 48 \ 60 \ 72 \ 84 \\ \underline{ } \\ 1 \\ 7 \end{array}$$

$$13 \overline{)3185} \begin{array}{r} 2 \ 4 \ 5 \\ -2 \ 6 \\ \hline 5 \ 8 \\ -5 \ 2 \\ \hline 6 \ 5 \\ -6 \ 5 \\ \hline 0 \ 0 \end{array}$$

Work out multiples of 13 by repeated addition.

$$\begin{array}{r} 13 \ 26 \ 39 \ 52 \ 65 \\ \underline{ } \\ 2 \\ 4 \\ 5 \end{array}$$

$$\begin{array}{r} \textcircled{13} \\ 13 \\ \textcircled{26} \\ 13 \\ \textcircled{39} \\ 13 \\ \textcircled{52} \\ 13 \\ \textcircled{65} \end{array}$$