

**Arithmetics**  
**Subtraction base 10**  
**[calculator-algebra.org](http://calculator-algebra.org)**

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2019

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$5 - 3 =$$

$$4 - 0 =$$

$$7 - 4 =$$

$$8 - 2 =$$

$$9 - 7 =$$

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$5 - 3 = ? \quad | \quad \text{because } 3 + ? = 5$$

$$4 - 0 =$$

$$7 - 4 =$$

$$8 - 2 =$$

$$9 - 7 =$$

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$5 - 3 = 2 \quad | \quad \text{because } 3 + 2 = 5$$

$$4 - 0 =$$

$$7 - 4 =$$

$$8 - 2 =$$

$$9 - 7 =$$

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$5 - 3 = 2 \quad \left| \quad \text{because } 3 + 2 = 5 \right.$$

$$4 - 0 = ? \quad \left| \quad \text{because } 0 + ? = 4 \right.$$

$$7 - 4 =$$

$$8 - 2 =$$

$$9 - 7 =$$

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$5 - 3 = 2 \quad \left| \text{because } 3 + 2 = 5 \right.$$

$$4 - 0 = 4 \quad \left| \text{because } 0 + 4 = 4 \right.$$

$$7 - 4 =$$

$$8 - 2 =$$

$$9 - 7 =$$

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$5 - 3 = 2 \quad \left| \quad \text{because } 3 + 2 = 5 \right.$$

$$4 - 0 = 4 \quad \left| \quad \text{because } 0 + 4 = 4 \right.$$

$$7 - 4 = ? \quad \left| \quad \text{because } 4 + ? = 7 \right.$$

$$8 - 2 =$$

$$9 - 7 =$$

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$5 - 3 = 2 \quad \left| \quad \text{because } 3 + 2 = 5 \right.$$

$$4 - 0 = 4 \quad \left| \quad \text{because } 0 + 4 = 4 \right.$$

$$7 - 4 = 3 \quad \left| \quad \text{because } 4 + 3 = 7 \right.$$

$$8 - 2 =$$

$$9 - 7 =$$



## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$5 - 3 = 2$	because $3 + 2 = 5$
$4 - 0 = 4$	because $0 + 4 = 4$
$7 - 4 = 3$	because $4 + 3 = 7$
$8 - 2 = ?$	because $2 + ? = 8$
$9 - 7 =$	

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$5 - 3 = 2 \quad \left| \quad \text{because } 3 + 2 = 5\right.$$

$$4 - 0 = 4 \quad \left| \quad \text{because } 0 + 4 = 4\right.$$

$$7 - 4 = 3 \quad \left| \quad \text{because } 4 + 3 = 7\right.$$

$$8 - 2 = 6 \quad \left| \quad \text{because } 2 + 6 = 8\right.$$

$$9 - 7 =$$

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$5 - 3 = 2$	because $3 + 2 = 5$
$4 - 0 = 4$	because $0 + 4 = 4$
$7 - 4 = 3$	because $4 + 3 = 7$
$8 - 2 = 6$	because $2 + 6 = 8$
$9 - 7 = ?$	because $7 + ? = 9$

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$5 - 3 = 2$	because $3 + 2 = 5$
$4 - 0 = 4$	because $0 + 4 = 4$
$7 - 4 = 3$	because $4 + 3 = 7$
$8 - 2 = 6$	because $2 + 6 = 8$
$9 - 7 = 2$	because $7 + 2 = 9$

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$6 - 1 =$$

$$9 - 5 =$$

$$8 - 2 =$$

+									

- To do one-digit subtraction: guess from addition table.





## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$\begin{array}{rcl}
 6 - 1 & = & 5 \\
 9 - 5 & = & ? \\
 8 - 2 & = & 
 \end{array}
 \quad \left| \quad \begin{array}{l}
 \text{because } 1 + 5 = 6 \\
 \text{because } 5 + ? = 9
 \end{array}
 \right.$$

+	1				5				
?					9				
5	6								

- To do one-digit subtraction: guess from addition table.



## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$6 - 1 = 5 \quad \left| \quad \text{because } 1 + 5 = 6 \right.$$

$$9 - 5 = 4 \quad \left| \quad \text{because } 5 + 4 = 9 \right.$$

$$8 - 2 =$$

+		1				5			
4						9			
5		6							

- To do one-digit subtraction: guess from addition table.

Subtract the one-digit numbers.

because  $1 + 5 = 6$

because  $5 + 4 = 9$

because  $2 + ? = 8$

+	1	2		5			
4				9			
5	6						
?		8					

- To do one-digit subtraction:  
guess from addition table.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$6 - 1 = 5 \quad \left| \quad \text{because } 1 + 5 = 6 \right.$$

$$9 - 5 = 4 \quad \left| \quad \text{because } 5 + 4 = 9 \right.$$

$$8 - 2 = 6 \quad \left| \quad \text{because } 2 + 6 = 8 \right.$$

+		1	2			5													
4										9									
5		6																	
6				8															

- To do one-digit subtraction: guess from addition table.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$6 - 1 = 5$	because $1 + 5 = 6$
$9 - 5 = 4$	because $5 + 4 = 9$
$8 - 2 = 6$	because $2 + 6 = 8$

+	?	1	2	?	?	5	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
4	?	?	?	?	?	9	?	?	?	?
5	?	6	?	?	?	?	?	?	?	?
6	?	?	8	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?

- To do one-digit subtraction: guess from addition table.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$6 - 1 = 5$	because $1 + 5 = 6$
$9 - 5 = 4$	because $5 + 4 = 9$
$8 - 2 = 6$	because $2 + 6 = 8$

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17	18

- To do one-digit subtraction: guess from addition table.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 =$$

$$8 - 4 =$$

$$7 - 7 =$$

+									

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 =$$

$$8 - 4 =$$

$$7 - 7 =$$

9

2

+			2						

- Subtraction can also be written in columns.





## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 =$$

$$8 - 4 =$$

$$7 - 7 =$$

9

2

+			2						
			9						

- Subtraction can also be written in columns.







## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 = 7$$

$$8 - 4 =$$

$$7 - 7 =$$

$$\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8 \\ - 4 \\ \hline \end{array}$$

+		2	4					
				8				
7		9						

- Subtraction can also be written in columns.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 = 7$$

$$8 - 4 =$$

$$7 - 7 =$$

$$\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8 \\ - 4 \\ \hline \end{array}$$

+		2	4					
			8					
7		9						

- Subtraction can also be written in columns.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 = 7$$

$$8 - 4 =$$

$$7 - 7 =$$

$$\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$$

8

4

+		2	4					
			8					
7		9						

- Subtraction can also be written in columns.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 = 7$$

$$8 - 4 =$$

$$7 - 7 =$$

$$\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8 \\ - 4 \\ \hline \end{array}$$

+		2	4					
			8					
7		9						

- Subtraction can also be written in columns.



## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 = 7$$

$$8 - 4 = ?$$

$$7 - 7 =$$

$$\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8 \\ - 4 \\ \hline ? \end{array}$$

+			2	4				
?				8				
7			9					

- Subtraction can also be written in columns.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 = 7$$

$$8 - 4 = 4$$

$$7 - 7 =$$

$$\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8 \\ - 4 \\ \hline 4 \end{array}$$

+		2	4					
4			8					
7		9						

- Subtraction can also be written in columns.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 = 7$$

$$8 - 4 = 4$$

$$7 - 7 =$$

$$\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8 \\ - 4 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 7 \\ - 7 \\ \hline \end{array}$$

+		2	4		7	
					7	
4			8			
7		9				

- Subtraction can also be written in columns.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 = 7$$

$$8 - 4 = 4$$

$$7 - 7 = 0$$

$$\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8 \\ - 4 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 7 \\ - 7 \\ \hline 0 \end{array}$$

+		2	4		7		
					7		
4			8				
7		9					

- Subtraction can also be written in columns.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 = 7$$

$$8 - 4 = 4$$

$$7 - 7 =$$

$$\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8 \\ - 4 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 7 \\ 7 \end{array}$$

+		2	4		7	
					7	
4			8			
7		9				

- Subtraction can also be written in columns.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 = 7$$

$$8 - 4 = 4$$

$$7 - 7 = 0$$

$$\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8 \\ - 4 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 7 \\ - 7 \\ \hline 0 \end{array}$$

+		2	4		7	
					7	
4			8			
7		9				

- Subtraction can also be written in columns.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 = 7$$

$$8 - 4 = 4$$

$$7 - 7 = ?$$

$$\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8 \\ - 4 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 7 \\ - 7 \\ \hline ? \end{array}$$

+			2		4		7	
?							7	
4					8			
7			9					

- Subtraction can also be written in columns.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 = 7$$

$$8 - 4 = 4$$

$$7 - 7 = 0$$

$$\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8 \\ - 4 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 7 \\ - 7 \\ \hline 0 \end{array}$$

+		2	4		7	
0					7	
4			8			
7		9				

- Subtraction can also be written in columns.



# Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 = 7$$

$$8 - 4 = 4$$

$$7 - 7 = 0$$

$$\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8 \\ - 4 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 7 \\ - 7 \\ \hline 0 \end{array}$$

+	?	?	2	?	4	?	?	7	?	?
0	?	?	?	?	?	?	?	7	?	?
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
4	?	?	?	?	8	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
7	?	?	9	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?

- Subtraction can also be written in columns.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$9 - 2 = 7$$

$$8 - 4 = 4$$

$$7 - 7 = 0$$

$$\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8 \\ - 4 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 7 \\ - 7 \\ \hline 0 \end{array}$$

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17	18

- Subtraction can also be written in columns.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 =$$

$$10 - 5 =$$

$$18 - 9 =$$

+									

Subtract the one-digit numbers.

$18 - 9 =$

3

[illegible]

- Addition table: can be used for subtraction from small two-digit numbers.



Subtract the one-digit numbers.

$18 - 9 =$

11  
3

[illegible]

- Addition table: can be used for subtraction from small two-digit numbers.

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## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 = 8$$

$$10 - 5 =$$

$$18 - 9 =$$

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

+			3						
8			11						

- Addition table: can be used for subtraction from small two-digit numbers.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 = 8$$

$$10 - 5 =$$

$$18 - 9 =$$

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline \end{array}$$

+			3	5				
				10				
8			11					

- Addition table: can be used for subtraction from small two-digit numbers.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 = 8$$

$$10 - 5 =$$

$$18 - 9 =$$

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline \end{array}$$

+			3	5				
8			11					

- Addition table: can be used for subtraction from small two-digit numbers.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 = 8$$

$$10 - 5 =$$

$$18 - 9 =$$

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline \end{array}$$

+			3	5				
				10				
8			11					

- Addition table: can be used for subtraction from small two-digit numbers.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 = 8$$

$$10 - 5 =$$

$$18 - 9 =$$

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline \end{array}$$

+			3	5				
					10			
8			11					

- Addition table: can be used for subtraction from small two-digit numbers.



## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 = 8$$

$$10 - 5 = 5$$

$$18 - 9 =$$

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline 5 \end{array}$$

+			3	5				
5				10				
8			11					

- Addition table: can be used for subtraction from small two-digit numbers.

# Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 = 8$$

$$10 - 5 = 5$$

$$18 - 9 =$$

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 18 \\ - 9 \\ \hline \end{array}$$

+			3	5			9
5				10			
8			11				
							18

- Addition table: can be used for subtraction from small two-digit numbers.



## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 = 8$$

$$10 - 5 = 5$$

$$18 - 9 =$$

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 18 \\ - 9 \\ \hline \end{array}$$

+			3	5			9
5				10			
8			11				
							18

- Addition table: can be used for subtraction from small two-digit numbers.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 = 8$$

$$10 - 5 = 5$$

$$18 - 9 =$$

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 18 \\ - 9 \\ \hline \end{array}$$

+			3	5				9
5				10				
8			11					
								18

- Addition table: can be used for subtraction from small two-digit numbers.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 = 8$$

$$10 - 5 = 5$$

$$18 - 9 =$$

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 18 \\ - 9 \\ \hline \end{array}$$

+			3	5			9
5				10			
8			11				
							18

- Addition table: can be used for subtraction from small two-digit numbers.

# Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 = 8$$

$$10 - 5 = 5$$

$$18 - 9 = ?$$

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 18 \\ - 9 \\ \hline ? \end{array}$$

+			3	5				9
5				10				
8			11					
?								18

- Addition table: can be used for subtraction from small two-digit numbers.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 = 8$$

$$10 - 5 = 5$$

$$18 - 9 = 9$$

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 18 \\ - 9 \\ \hline 9 \end{array}$$

+			3	5				9
5				10				
8			11					
9								18

- Addition table: can be used for subtraction from small two-digit numbers.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 = 8$$

$$10 - 5 = 5$$

$$18 - 9 = 9$$

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 18 \\ - 9 \\ \hline 9 \end{array}$$

+	?	?	?	3	?	5	?	?	?	9
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
5	?	?	?	?	?	10	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?
8	?	?	?	?	11	?	?	?	?	?
9	?	?	?	?	?	?	?	?	?	18

- Addition table: can be used for subtraction from small two-digit numbers.

## Example (One digit subtraction, result $> 0$ )

Subtract the one-digit numbers.

$$11 - 3 = 8$$

$$10 - 5 = 5$$

$$18 - 9 = 9$$

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 18 \\ - 9 \\ \hline 9 \end{array}$$

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17	18

- Addition table: can be used for subtraction from small two-digit numbers.

# Negative integers

- The negative integers are the numbers:

$$\dots, -6, -5, -4, -3, -2, -1$$



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- Written as the minus sign – followed by a (positive) number.

# Negative integers

- The negative integers are the numbers:

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- Written as the minus sign – followed by a (positive) number.
- Negatives are to the left of 0 on the **number line**.



# Negative integers

- The negative integers are the numbers:

$\dots, -6, -5, -4, -3, -2, -1$

- Written as the minus sign – followed by a (positive) number.
- **Negatives** are to the **left of 0** on the number line.



# Negative integers

- The negative integers are the numbers:

$\dots, -6, -5, -4, -3, -2, -1$

- Written as the minus sign  $-$  followed by a (positive) number.
- Negatives are to the left of 0 on the number line.



- $-1$  is as far away from 0 as 1 is.

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- $-1$  is as far away from 0 as 1 is.
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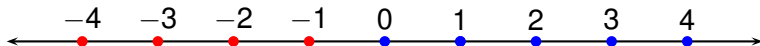
- $-1$  is as far away from 0 as 1 is.
- $-2$  is as far away from 0 as 2 is.

# Negative integers

- The negative integers are the numbers:

$\dots, -6, -5, -4, -3, -2, -1$

- Written as the minus sign  $-$  followed by a (positive) number.
- Negatives are to the left of 0 on the number line.



- $-1$  is as far away from 0 as 1 is.
- $-2$  is as far away from 0 as 2 is.
- $\dots$  and so on.



# Negative sign as a function

- The negative sign can be regarded as a function/operator:

## Rule

$$-(a) = -a \quad \text{if } a > 0$$

## Example

$$-(5) = -5$$

- On the left,  $-$  is regarded as a function that takes as input a positive number and produces an output that is a negative number.
- On the right,  $-$  is regarded as a part of the notation for negative numbers.

# Absolute value (magnitude) of a number

## Definition (Magnitude of a number)

The magnitude or absolute value  $|x|$  of a number  $x$  is defined as:

- The number itself, if the number is non-negative.

$$|a| = a, \quad \text{if } a \text{ is non-negative.}$$

- The number with negative sign removed, if the number is negative.

$$|-a| = a, \quad \text{if } a \text{ is negative.}$$

## Example

$$\begin{array}{rcl} |4| & = & 4 \\ |-5| & = & 5 \\ |0| & = & 0 \end{array}$$

# Negative of a negative

## Rule

*The negative of a negative of a number is the number itself.*

$$-(-a) = a$$

- Parenthesis are necessary when using multiple negative signs.

Incorrect      Correct

$$\cancel{>a} \quad -(-a)$$

- The rule is independent of whether  $a$  is positive or negative.
- Can be applied consecutively for more than 2 negative signs.

## Example

$$\begin{aligned} -(-5) &= 5 \\ -(-(-7)) &= -(7) = -7 \\ -(-(-(-1))) &= -(-1) = 1 \end{aligned}$$

# Sum with a negative

## Rule

*Subtracting a number is the same as adding its negative.*

$$a + (-b) = a - b$$

$$-a + b = b - a$$

## Example

$$5 + (-3) = 5 - 3 = 2$$

$$10 + (-5) = 10 - 5 = 5$$

$$-1 + 8 = 8 - 1 = 7$$

$$-8 + 14 = 14 - 8 = 6$$

# Negative of a sum

## Rule

*The sum of negatives is the negative of the sum.*

$$-a - b = -(a + b)$$

*The difference of two numbers is minus the opposite difference.*

$$a - b = -(b - a)$$

## Example

$$\begin{array}{rclcl} -5 - 7 & = & -(5 + 7) & = & -12 \\ -7 + (-8) & = & -7 - 8 & = & -(7 + 8) = -15 \\ 5 - 9 & = & -(9 - 5) & = & -4 \\ 6 - 11 & = & -(11 - 6) & = & -5 \\ -9 + 3 & = & 3 - 9 & = & -(9 - 3) = -6 \end{array}$$

# Summary of algebra rules involving subtraction

## Rule

$$\begin{aligned} -(-a) &= a \\ a + (-b) &= a - b \\ -a + b &= b - a \\ -a - b &= -(a + b) \\ a - b &= -(b - a) \end{aligned}$$

## Example

Find the number  $x$  so that:  $5 + x = 9$ . Solution:

$$\begin{array}{rcl|l} 5 + x & = & 9 & \text{transfer 5 to the right hand side} \\ x & = & 9 - 5 & \text{When transferred, 5 acquires negative sign} \\ x & = & 4 & \end{array}$$

## Observation

*At the price of a negative sign, one is allowed to transfer summands from one side of an equation to the other.*

$$\begin{array}{rcl|l} a + b & = & c & \text{transfer } a \text{ to the right hand side} \\ b & = & c - a & \end{array}$$

## Example

Solve the equation.

$$8 + x = 9 \quad \text{Answer: } x = 1$$

$$3 + t = 11 \quad \text{Answer: } t = 8$$

$$5 + a = 10 \quad \text{Answer: } a = 5$$

$$8 + s = 16 \quad \text{Answer: } s = 8$$

## Example

Solve the equation.

$$7 + x = 2$$

Solution.

$$\begin{array}{rcll} 7 + x & = & 2 & \text{Transfer 7 to the other side} \\ x & = & 2 - 7 = -5 & \end{array}$$



## Example

Solve the equation.

$$3 + x = 7 \quad \text{Answer: } x = 4$$

$$1 + a = 10 \quad \text{Answer: } a = 9$$

$$3 + x = 1 \quad \text{Answer: } x = -2$$

$$5 + x = 0 \quad \text{Answer: } x = -5$$

$$9 + a = 15 \quad \text{Answer: } a = 6$$

$$4 + z = 13 \quad \text{Answer: } z = 9$$

$$9 + x = 8 \quad \text{Answer: } x = -1$$

$$9 + x = 1 \quad \text{Answer: } x = -8$$

## Example

Find  $w, x, y, z$  so as to satisfy each equality below.

$$-4 = -10 + w$$

Solution

$$-4 = (-10 + 10) - 4 = -10 + (10 - 4) = -10 + 6 \Rightarrow w = 6$$

$$-2 = -10 + x$$

Solution

$$-2 = (-10 + 10) - 2 = -10 + (10 - 2) = -10 + 8 \Rightarrow x = 8$$

$$-1 = -10 + y$$

Solution

$$-1 = (-10 + 10) - 1 = -10 + (10 - 1) = -10 + 9 \Rightarrow y = 9$$

$$-9 = -10 + z$$

Solution

$$-9 = (-10 + 10) - 9 = -10 + (10 - 9) = -10 + 1 \Rightarrow z = 1$$

Subtract 5 from 71.

Subtract 5 from 71.

$$\begin{array}{r} 71 \\ -5 \\ \hline \end{array}$$

Subtract 5 from 71.

$$\begin{array}{r} 71 \\ - 5 \\ \hline \end{array}$$

Subtract 5 from 71.

$$\begin{array}{r} 71 \\ - 5 \\ \hline \end{array}$$

- Ensure summand  $>$  subtracand.

Subtract 5 from 71.

$$\begin{array}{r} 71 \\ - 5 \\ \hline \end{array}$$

- Ensure summand  $>$  subtracand.

Subtract 5 from 71.

$$\begin{array}{r} \phantom{0}7\phantom{0}1 \\ - \phantom{0}0\phantom{0}5 \\ \hline \end{array}$$

- Ensure summand  $>$  subtracand.

$$1 - 5 = ?$$



Subtract 5 from 71.

$$\begin{array}{r} \phantom{0}7\phantom{0}1 \\ - \phantom{0}0\phantom{0}5 \\ \hline \end{array}$$

- Ensure summand  $>$  subtracand.

$$1 - 5 = -4$$

Subtract 5 from 71.

$$\begin{array}{r} -1 \\ 71 \\ - 5 \\ \hline ? \end{array}$$

- Ensure summand  $>$  subtracand.

$$1 - 5 = -4 = -10 + ?$$

Subtract 5 from 71.

$$\begin{array}{r} \textcolor{red}{-1} \\ 71 \\ - 5 \\ \hline \textcolor{red}{6} \end{array}$$

- Ensure summand  $>$  subtracand.

$$1 - 5 = \textcolor{red}{-4} = \textcolor{red}{-10} + \textcolor{red}{6}$$

Subtract 5 from 71.

$$\begin{array}{r} -1 \\ 71 \\ -5 \\ \hline 6 \end{array}$$

- Ensure summand  $>$  subtracand.

$$1 - 5 = -4 = -10 + 6$$

Subtract 5 from 71.

$$\begin{array}{r}
 \textcolor{red}{-1} \\
 71 \\
 -5 \\
 \hline
 6
 \end{array}$$

- Ensure summand  $>$  subtracand.

$$1 - 5 = -4 = \textcolor{red}{-1}0 + 6$$

Subtract 5 from 71.

$$\begin{array}{r}
 -1 \\
 7 \quad 1 \\
 - \quad 5 \\
 \hline
 ? \quad 6
 \end{array}$$

- Ensure summand  $>$  subtracand.

$$\begin{aligned}
 1 - 5 &= -4 = -10 + 6 \\
 -1 + 7 - 0 &= ?
 \end{aligned}$$

Subtract 5 from 71.

$$\begin{array}{r}
 -1 \\
 7 \quad 1 \\
 - \quad 5 \\
 \hline
 6 \quad 6
 \end{array}$$

- Ensure summand  $>$  subtracand.

$$\begin{aligned}
 1 - 5 &= -4 = -10 + 6 \\
 -1 + 7 - 0 &= 6
 \end{aligned}$$

Subtract 108 from 111.



Subtract 108 from 111.

$$\begin{array}{r} 1 \quad 1 \quad 1 \\ 1 \quad 0 \quad 8 \end{array}$$

Subtract 108 from 111.

$$\begin{array}{r} 1 \quad 1 \quad 1 \\ 1 \quad 0 \quad 8 \end{array}$$

Subtract 108 from 111.

1	1	1
1	0	8

- Ensure summand  $>$  subtracand.

Subtract 108 from 111.

$$\begin{array}{r} 1 \quad 1 \quad 1 \\ - 1 \quad 0 \quad 8 \\ \hline \end{array}$$

- Ensure summand  $>$  subtracand.

Subtract 108 from 111.

$$\begin{array}{r} 1 \quad 1 \quad 1 \\ - 1 \quad 0 \quad 8 \\ \hline \end{array}$$

- Ensure summand  $>$  subtracand.

$$1 - 8 = ?$$

Subtract 108 from 111.

$$\begin{array}{r} 1 \quad 1 \quad 1 \\ - 1 \quad 0 \quad 8 \\ \hline \end{array}$$

- Ensure summand  $>$  subtracand.

$$1 - 8 = -7$$









$$\begin{array}{r} \phantom{-}\phantom{0}1\phantom{0}1\phantom{0}1 \\ -1\phantom{0}0\phantom{0}8 \\ \hline \phantom{0}3 \end{array}$$

- $$1 - 8 = -7 = -10 + 3$$



Subtract 108 from 111.

$$\begin{array}{r}
 \phantom{-} \phantom{1} \overset{-1}{1} \phantom{1} \\
 \phantom{-} 1 \phantom{0} \phantom{0} 1 \\
 - \phantom{1} 1 \phantom{0} 8 \\
 \hline
 \phantom{-} \phantom{1} \phantom{0} 3
 \end{array}$$

- Ensure summand  $>$  subtracand.

$$\begin{aligned}
 1 - 8 &= -7 = -10 + 3 \\
 -1 + 1 - 0 &= 0
 \end{aligned}$$



$$\begin{array}{r} -1 \\ 1 \quad 1 \quad 1 \\ -1 \quad 0 \quad 8 \\ \hline 0 \quad 0 \quad 3 \end{array}$$

- $$\begin{array}{r} 1 - 8 = -7 = -10 + 3 \\ -1 + 1 - 0 = 0 \\ \color{red}{1 - 1 = 0} \end{array}$$







Compute  $447 - 509$

When the **subtracand** is larger than the summand

Compute  $447 - 509$

When the subtracand is larger than the **summand**

Compute **447** – 509

When the subtracand is larger than the summand, we first use the rule

$$a - b = -(b - a).$$

Compute  $447 - 509 = -(509 - 447)$ .

When the **subtracand** is larger than the summand, we first use the rule

$$a - b = -(b - a).$$

Compute  $447 - 509 = -(509 - 447)$ .

When the subtracand is larger than the **summand**, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(509 - 447)$ .

When the subtracand is larger than the summand, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(509 - 447)$ .

$$\begin{array}{r} 5 \ 0 \ 9 \\ 4 \ 4 \ 7 \end{array}$$

When the subtracand is larger than the summand, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(\textcolor{red}{509} - 447)$ .

$$\begin{array}{r} \textcolor{red}{5} \ \textcolor{red}{0} \ \textcolor{red}{9} \\ 4 \ 4 \ 7 \end{array}$$



When the subtracand is larger than the summand, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(509 - 447)$ .

$$\begin{array}{r} 509 \\ 447 \end{array}$$

- Ensure summand  $>$  subtracand.

When the subtracand is larger than the summand, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(509 - 447)$ .

$$\begin{array}{r} \phantom{0}5\phantom{0}9 \\ -\phantom{0}4\phantom{0}4\phantom{0}7 \\ \hline \end{array}$$

- Ensure summand  $>$  subtracand.

When the subtracand is larger than the summand, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(509 - 447)$ .

$$\begin{array}{r} \phantom{—} 5 \phantom{0} 9 \\ - 4 \phantom{0} 7 \\ \hline \phantom{—} \phantom{0} ? \end{array}$$

- Ensure summand  $>$  subtracand.

$$9 - 7 = ?$$

When the subtracand is larger than the summand, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(509 - 447)$ .

$$\begin{array}{r} 509 \\ - 447 \\ \hline 2 \end{array}$$

- Ensure summand  $>$  subtracand.

$$9 - 7 = 2$$

When the subtracand is larger than the summand, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(509 - 447)$ .

$$\begin{array}{r} \phantom{0}5\phantom{0}9 \\ -447 \\ \hline \phantom{0}2 \end{array}$$

- Ensure summand  $>$  subtracand.

$$9 - 7 = 2$$

$$0 - 4 = ?$$

When the subtracand is larger than the summand, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(509 - 447)$ .

$$\begin{array}{r} \phantom{—} \phantom{0} 5 \phantom{0} 0 \phantom{0} 9 \\ \phantom{—} \phantom{0} 4 \phantom{0} 4 \phantom{0} 7 \\ \hline \phantom{—} \phantom{0} \phantom{0} \phantom{0} 2 \end{array}$$

- Ensure summand  $>$  subtracand.

$$\begin{array}{l} 9 - 7 = 2 \\ 0 - 4 = -4 \end{array}$$







When the subtracand is larger than the summand, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(509 - 447)$ .

$$\begin{array}{r}
 -1 \\
 \phantom{-} 5 \phantom{0} 9 \\
 - \phantom{5} 4 \phantom{0} 7 \\
 \hline
 \phantom{5} 6 \phantom{0} 2
 \end{array}$$

- Ensure summand  $>$  subtracand.

$$9 - 7 = 2$$

$$0 - 4 = -4 = -10 + 6$$

When the subtracand is larger than the summand, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(509 - 447)$ .

$$\begin{array}{r}
 \textcolor{red}{-1} \\
 \phantom{0}5 \phantom{0}9 \\
 - \phantom{0}4 \phantom{0}4 \phantom{0}7 \\
 \hline
 \phantom{0}6 \phantom{0}2
 \end{array}$$

- Ensure summand  $>$  subtracand.

$$9 - 7 = 2$$

$$0 - 4 = -4 = \textcolor{red}{-1}0 + 6$$

When the subtracand is larger than the summand, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(509 - 447)$ .

$$\begin{array}{r}
 -1 \\
 \phantom{-} 5 \phantom{0} 9 \\
 - \phantom{5} 4 \phantom{0} 7 \\
 \hline
 \phantom{-} ? \phantom{0} 6 \phantom{0} 2
 \end{array}$$

- Ensure summand  $>$  subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 0 - 4 &= -4 = -10 + 6 \\
 -1 + 5 - 4 &= ?
 \end{aligned}$$

When the subtracand is larger than the summand, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(509 - 447)$ .

$$\begin{array}{r}
 -1 \\
 \phantom{-} 5 \phantom{0} 9 \\
 - \phantom{5} 4 \phantom{0} 7 \\
 \hline
 \phantom{-} 0 \phantom{6} 2
 \end{array}$$

- Ensure summand  $>$  subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 0 - 4 &= -4 = -10 + 6 \\
 -1 + 5 - 4 &= 0
 \end{aligned}$$

When the subtracand is larger than the summand, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(509 - 447)$ .

$$\begin{array}{r}
 -1 \\
 \phantom{-} 5 \phantom{0} 9 \\
 - \phantom{5} 4 \phantom{0} 7 \\
 \hline
 \phantom{-} 0 \phantom{0} 6 \phantom{0} 2
 \end{array}$$

- Ensure summand  $>$  subtracand.
- Remove leading zeroes.

$$\begin{aligned}
 9 - 7 &= 2 \\
 0 - 4 &= -4 = -10 + 6 \\
 -1 + 5 - 4 &= 0
 \end{aligned}$$

When the subtracand is larger than the summand, we first use the rule  $a - b = -(b - a)$ .

Compute  $447 - 509 = -(509 - 447)$ .

$$\begin{array}{r}
 -1 \\
 \phantom{-} 5 \phantom{0} 9 \\
 - \phantom{5} 4 \phantom{0} 7 \\
 \hline
 \phantom{-} 6 \phantom{0} 2
 \end{array}$$

- Ensure summand  $>$  subtracand.
- Remove leading zeroes.

$$\begin{aligned}
 9 - 7 &= 2 \\
 0 - 4 &= -4 = -10 + 6 \\
 -1 + 5 - 4 &= 0
 \end{aligned}$$

Subtract 1234567 from 20182019.

Subtract 1234567 from 20182019.

2	0	1	8	2	0	1	9
	1	2	3	4	5	6	7



Subtract 1234567 from 20182019.

2	0	1	8	2	0	1	9
	1	2	3	4	5	6	7

Subtract 1234567 from 20182019.

2	0	1	8	2	0	1	9
	1	2	3	4	5	6	7

- Ensure summand  
> subtracand.

Subtract 1234567 from 20182019.

$$\begin{array}{r} \phantom{0000000} 2 \phantom{00} 0 \phantom{00} 1 \phantom{00} 8 \phantom{00} 2 \phantom{00} 0 \phantom{00} 1 \phantom{00} 9 \\ \phantom{0000000} 1 \phantom{00} 2 \phantom{00} 3 \phantom{00} 4 \phantom{00} 5 \phantom{00} 6 \phantom{00} 7 \\ \hline \end{array}$$

- Ensure summand > subtracand.

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \text{---} \quad 2 \quad 0 \quad 1 \quad 8 \quad 2 \quad 0 \quad 1 \quad 9 \\
 \quad \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \\
 \hline
 \quad \quad \quad \quad \quad \quad \quad \quad ?
 \end{array}$$

- Ensure summand  
> subtracand.

$$9 - 7 = ?$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{0000000}2 \phantom{00000}0 \phantom{00000}1 \phantom{00000}8 \phantom{00000}2 \phantom{00000}0 \phantom{00000}1 \phantom{00000}9 \\
 \phantom{0000000}1 \phantom{00000}2 \phantom{00000}3 \phantom{00000}4 \phantom{00000}5 \phantom{00000}6 \phantom{00000}7 \\
 \hline
 \phantom{0000000} \phantom{00000} \phantom{00000} \phantom{00000} \phantom{00000} \phantom{00000} \phantom{00000}2
 \end{array}$$

- Ensure summand  
> subtracand.

$$9 - 7 = 2$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{00}2\phantom{00}0\phantom{00}1\phantom{00}8\phantom{00}2\phantom{00}0\phantom{00}1\phantom{00}9 \\
 \phantom{00}1\phantom{00}2\phantom{00}3\phantom{00}4\phantom{00}5\phantom{00}6\phantom{00}7 \\
 \hline
 \phantom{00}\phantom{00}\phantom{00}\phantom{00}\phantom{00}\phantom{00}\phantom{00}2
 \end{array}$$

- Ensure summand  
> subtracand.

$$9 - 7 = 2$$

$$1 - 6 = ?$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{0000000} 2 \phantom{00000} 0 \phantom{00000} 1 \phantom{00000} 8 \phantom{00000} 2 \phantom{00000} 0 \phantom{00000} \color{red}{1} \phantom{00000} 9 \\
 \phantom{0000000} \phantom{00000} 1 \phantom{00000} 2 \phantom{00000} 3 \phantom{00000} 4 \phantom{00000} 5 \phantom{00000} \color{red}{6} \phantom{00000} 7 \\
 \hline
 \phantom{0000000} \phantom{00000} \phantom{00000} \phantom{00000} \phantom{00000} \phantom{00000} \phantom{00000} \phantom{00000} 2
 \end{array}$$

- Ensure summand  
> subtracand.

$$\begin{array}{l}
 9 - 7 = 2 \\
 \color{red}{1} - \color{red}{6} = \color{red}{-5}
 \end{array}$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{0}2\phantom{0}1\phantom{0}8\phantom{0}2\phantom{0}0\phantom{0}1\phantom{0}9 \\
 \phantom{0}1\phantom{0}2\phantom{0}3\phantom{0}4\phantom{0}5\phantom{0}6\phantom{0}7 \\
 \hline
 \phantom{0}\phantom{0}\phantom{0}\phantom{0}\phantom{0}\phantom{0}?\phantom{0}2
 \end{array}$$

$-1$

- Ensure summand  
> subtracand.

$$9 - 7 = 2$$

$$1 - 6 = -5 = -10 + ?$$



Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{00}2\phantom{00}0\phantom{00}1\phantom{00}8\phantom{00}2\phantom{00}0\phantom{00}1\phantom{00}9 \\
 \phantom{00}1\phantom{00}2\phantom{00}3\phantom{00}4\phantom{00}5\phantom{00}6\phantom{00}7 \\
 \hline
 \phantom{00}\phantom{00}\phantom{00}\phantom{00}\phantom{00}\phantom{00}5\phantom{00}2
 \end{array}$$

$-1$

- Ensure summand  
> subtracand.

$$9 - 7 = 2$$

$$1 - 6 = -5 = -10 + 5$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{0000000} - 1 \\
 \begin{array}{cccccccc}
 & 2 & 0 & 1 & 8 & 2 & 0 & 1 & 9 \\
 \hline
 & & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\
 \hline
 & & & & & & 5 & 2 & 
 \end{array}
 \end{array}$$

- Ensure summand > subtracand.

$$9 - 7 = 2$$

$$1 - 6 = -5 = -10 + 5$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{0000000} \overset{\textcolor{red}{-1}}{0} \\
 \phantom{0000000} 2 \phantom{0} 1 \phantom{0} 8 \phantom{0} 2 \phantom{0} 0 \phantom{0} 1 \phantom{0} 9 \\
 \phantom{0000000} \phantom{0} 1 \phantom{0} 2 \phantom{0} 3 \phantom{0} 4 \phantom{0} 5 \phantom{0} 6 \phantom{0} 7 \\
 \hline
 \phantom{0000000} \phantom{0000000} \phantom{0000000} \phantom{0000000} \phantom{0000000} 5 \phantom{0} 2
 \end{array}$$

- Ensure summand  
> subtracand.

$$9 - 7 = 2$$

$$1 - 6 = -5 = \textcolor{red}{-1}0 + 5$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{000000}2 \phantom{00000}0 \phantom{00000}1 \phantom{00000}8 \phantom{00000}2 \phantom{00000}0 \phantom{00000}1 \phantom{00000}9 \\
 \phantom{000000}1 \phantom{00000}2 \phantom{00000}3 \phantom{00000}4 \phantom{00000}5 \phantom{00000}6 \phantom{00000}7 \\
 \hline
 \phantom{000000}\phantom{00000}\phantom{00000}\phantom{00000}\phantom{00000}\phantom{00000}5 \phantom{00000}2
 \end{array}$$

- Ensure summand > subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= ?
 \end{aligned}$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{0}2\phantom{0}1\phantom{0}8\phantom{0}2\phantom{0}1\phantom{0}9 \\
 \underline{\phantom{0}1\phantom{0}2\phantom{0}3\phantom{0}4\phantom{0}5\phantom{0}6\phantom{0}7} \\
 \phantom{0}5\phantom{0}2
 \end{array}$$

$-1$   
 $0$   
 $5$

- Ensure summand  
> subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6
 \end{aligned}$$



$-1$   $-1$

- Ensure summand  $>$  subtracand.

2019

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{0000000} -1 \phantom{000000} -1 \\
 \begin{array}{r}
 \phantom{0000000} 2 \phantom{000000} 0 \phantom{000000} 1 \phantom{000000} 8 \phantom{000000} 2 \phantom{000000} 0 \phantom{000000} 1 \phantom{000000} 9 \\
 \phantom{0000000} 1 \phantom{000000} 2 \phantom{000000} 3 \phantom{000000} 4 \phantom{000000} 5 \phantom{000000} 6 \phantom{000000} 7 \\
 \hline
 \phantom{0000000} \phantom{000000} \phantom{000000} \phantom{000000} \phantom{000000} 4 \phantom{000000} 5 \phantom{000000} 2
 \end{array}
 \end{array}$$

- Ensure summand > subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6 = -10 + 4
 \end{aligned}$$



Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{00}2\phantom{00}0\phantom{00}1\phantom{00}8\phantom{00}2\phantom{00}0\phantom{00}1\phantom{00}9 \\
 \phantom{00}1\phantom{00}2\phantom{00}3\phantom{00}4\phantom{00}5\phantom{00}6\phantom{00}7 \\
 \hline
 \phantom{00}\phantom{00}\phantom{00}\phantom{00}\phantom{00}4\phantom{00}5\phantom{00}2
 \end{array}$$

- Ensure summand > subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6 = -10 + 4
 \end{aligned}$$

$$\begin{array}{rcccccccc} & & & & -1 & -1 & & \\ & 2 & 0 & 1 & 8 & 2 & 0 & 1 & 9 \\ - & & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ \hline & & & & & & 4 & 5 & 2 \end{array}$$

- Ensure summand  $>$  subtracand.

$$\begin{array}{r} 9 - 7 = 2 \\ 1 - 6 = -5 = -10 + 5 \\ -1 + 0 - 5 = -6 = -10 + 4 \\ -1 + 2 - 4 = ? \end{array}$$

$$\begin{array}{rcccccccc} & & & & -1 & -1 & & \\ & 2 & 0 & 1 & 8 & 2 & 0 & 1 & 9 \\ - & & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ \hline & & & & & & 4 & 5 & 2 \end{array}$$

- Ensure summand  $>$  subtracand.

$$\begin{array}{r} 9 - 7 = 2 \\ 1 - 6 = -5 = -10 + 5 \\ -1 + 0 - 5 = -6 = -10 + 4 \\ -1 + 2 - 4 = -3 \end{array}$$

				-1	-1	-1		
	2	0	1	8	2	0	1	9
		1	2	3	4	5	6	7
					?	4	5	2

- Ensure summand  $>$  subtracand.

$$\begin{array}{r} 9 - 7 = 2 \\ 1 - 6 = -5 = -10 + 5 \\ -1 + 0 - 5 = -6 = -10 + 4 \\ -1 + 2 - 4 = -3 = -10 + ? \end{array}$$

$$\begin{array}{rcccccccc} & & & & -1 & -1 & -1 & & \\ & 2 & 0 & 1 & 8 & 2 & 0 & 1 & 9 \\ - & & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ \hline & & & & & 7 & 4 & 5 & 2 \end{array}$$

- $$\begin{array}{l} 9 - 7 = 2 \\ 1 - 6 = -5 = -10 + 5 \\ -1 + 0 - 5 = -6 = -10 + 4 \\ -1 + 2 - 4 = -3 = -10 + 7 \end{array}$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{0000000} -1 \phantom{00} -1 \phantom{00} -1 \\
 \phantom{00} 2 \phantom{00} 0 \phantom{00} 1 \phantom{00} 8 \phantom{00} 2 \phantom{00} 0 \phantom{00} 1 \phantom{00} 9 \\
 \phantom{00} \phantom{00} 1 \phantom{00} 2 \phantom{00} 3 \phantom{00} 4 \phantom{00} 5 \phantom{00} 6 \phantom{00} 7 \\
 \hline
 \phantom{0000000} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \textcolor{red}{7} \phantom{00} 4 \phantom{00} 5 \phantom{00} 2
 \end{array}$$

- Ensure summand > subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6 = -10 + 4 \\
 -1 + 2 - 4 &= -3 = -10 + \textcolor{red}{7}
 \end{aligned}$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{0000000} \overset{\text{red}}{-1} \phantom{0000000} \overset{-1}{-1} \phantom{0000000} \overset{-1}{-1} \\
 \phantom{0000000} 2 \phantom{0000000} 0 \phantom{0000000} 1 \phantom{0000000} 8 \phantom{0000000} 2 \phantom{0000000} 0 \phantom{0000000} 1 \phantom{0000000} 9 \\
 \phantom{0000000} \underline{\phantom{0000000} 1 \phantom{0000000} 2 \phantom{0000000} 3 \phantom{0000000} 4 \phantom{0000000} 5 \phantom{0000000} 6 \phantom{0000000} 7} \\
 \phantom{0000000} \phantom{0000000} \phantom{0000000} \phantom{0000000} 7 \phantom{0000000} 4 \phantom{0000000} 5 \phantom{0000000} 2
 \end{array}$$

- Ensure summand > subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6 = -10 + 4 \\
 -1 + 2 - 4 &= -3 = \text{red } -10 + 7
 \end{aligned}$$

				-1	-1	-1		
	2	0	1	8	2	0	1	9
—		1	2	3	4	5	6	7
				?	7	4	5	2

- Ensure summand  $>$  subtracand.

$$\begin{array}{r} 9 - 7 = 2 \\ 1 - 6 = -5 = -10 + 5 \\ -1 + 0 - 5 = -6 = -10 + 4 \\ -1 + 2 - 4 = -3 = -10 + 7 \\ -1 + 8 - 3 = ? \end{array}$$



$$\begin{array}{rccccccccc} & & & & -1 & -1 & -1 & & \\ & 2 & 0 & 1 & 8 & 2 & 0 & 1 & 9 \\ - & & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ \hline & & & & 4 & 7 & 4 & 5 & 2 \end{array}$$

- Ensure summand  $>$  subtracand.

$$\begin{array}{r} 9 - 7 = 2 \\ 1 - 6 = -5 = -10 + 5 \\ -1 + 0 - 5 = -6 = -10 + 4 \\ -1 + 2 - 4 = -3 = -10 + 7 \\ -1 + 8 - 3 = 4 \end{array}$$

			-1	-1	-1			
—	2	0	1	8	2	0	1	9
		1	2	3	4	5	6	7
				4	7	4	5	2

- Ensure summand  $>$  subtracand.

$$\begin{array}{r} 9 - 7 = 2 \\ 1 - 6 = -5 = -10 + 5 \\ -1 + 0 - 5 = -6 = -10 + 4 \\ -1 + 2 - 4 = -3 = -10 + 7 \\ -1 + 8 - 3 = 4 \\ 1 - 2 = ? \end{array}$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{20182019} -1 \phantom{000} -1 \phantom{00} -1 \phantom{000} \\
 \phantom{20182019} \phantom{000} 2 \phantom{00} 0 \phantom{00} \color{red}{1} \phantom{00} 8 \phantom{00} 2 \phantom{00} 0 \phantom{00} 1 \phantom{00} 9 \\
 \phantom{20182019} \phantom{000} \phantom{00} 1 \phantom{00} \color{red}{2} \phantom{00} 3 \phantom{00} 4 \phantom{00} 5 \phantom{00} 6 \phantom{00} 7 \\
 \hline
 \phantom{20182019} \phantom{000} \phantom{00} \phantom{00} 4 \phantom{00} 7 \phantom{00} 4 \phantom{00} 5 \phantom{00} 2
 \end{array}$$

- Ensure summand > subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6 = -10 + 4 \\
 -1 + 2 - 4 &= -3 = -10 + 7 \\
 -1 + 8 - 3 &= 4 \\
 \color{red}{1 - 2} &= \color{red}{-1}
 \end{aligned}$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{00} \phantom{00} \textcolor{red}{-1} \phantom{00} \phantom{00} -1 \phantom{00} -1 \phantom{00} -1 \\
 \phantom{00} 2 \phantom{00} 0 \phantom{00} 1 \phantom{00} 8 \phantom{00} 2 \phantom{00} 0 \phantom{00} 1 \phantom{00} 9 \\
 \phantom{00} \phantom{00} 1 \phantom{00} 2 \phantom{00} 3 \phantom{00} 4 \phantom{00} 5 \phantom{00} 6 \phantom{00} 7 \\
 \hline
 \phantom{00} \phantom{00} \phantom{00} \textcolor{red}{?} \phantom{00} 4 \phantom{00} 7 \phantom{00} 4 \phantom{00} 5 \phantom{00} 2
 \end{array}$$

- Ensure summand > subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6 = -10 + 4 \\
 -1 + 2 - 4 &= -3 = -10 + 7 \\
 -1 + 8 - 3 &= 4 \\
 1 - 2 &= \textcolor{red}{-1} = \textcolor{red}{-10} + \textcolor{red}{?}
 \end{aligned}$$

		-1		-1	-1	-1		
—	2	0	1	8	2	0	1	9
		1	2	3	4	5	6	7
			9	4	7	4	5	2

- Ensure summand  $>$  subtracand.

$$\begin{array}{r} 9 - 7 = 2 \\ 1 - 6 = -5 = -10 + 5 \\ -1 + 0 - 5 = -6 = -10 + 4 \\ -1 + 2 - 4 = -3 = -10 + 7 \\ -1 + 8 - 3 = 4 \\ 1 - 2 = -1 = -10 + 9 \end{array}$$

		-1		-1	-1	-1		
—	2	0	1	8	2	0	1	9
		1	2	3	4	5	6	7
			9	4	7	4	5	2

- Ensure summand  $>$  subtracand.

$$\begin{array}{r} 9 - 7 = 2 \\ 1 - 6 = -5 = -10 + 5 \\ -1 + 0 - 5 = -6 = -10 + 4 \\ -1 + 2 - 4 = -3 = -10 + 7 \\ -1 + 8 - 3 = 4 \\ 1 - 2 = -1 = -10 + 9 \end{array}$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{00} \phantom{00} \textcolor{red}{-1} \phantom{00} \phantom{00} -1 \phantom{00} -1 \phantom{00} -1 \\
 \phantom{00} 2 \phantom{00} 0 \phantom{00} 1 \phantom{00} 8 \phantom{00} 2 \phantom{00} 0 \phantom{00} 1 \phantom{00} 9 \\
 \phantom{00} \phantom{00} 1 \phantom{00} 2 \phantom{00} 3 \phantom{00} 4 \phantom{00} 5 \phantom{00} 6 \phantom{00} 7 \\
 \hline
 \phantom{00} \phantom{00} \phantom{00} 9 \phantom{00} 4 \phantom{00} 7 \phantom{00} 4 \phantom{00} 5 \phantom{00} 2
 \end{array}$$

- Ensure summand > subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6 = -10 + 4 \\
 -1 + 2 - 4 &= -3 = -10 + 7 \\
 -1 + 8 - 3 &= 4 \\
 1 - 2 &= -1 = \textcolor{red}{-10} + 9
 \end{aligned}$$

[illegible]

- Ensure summand  $>$  subtracand.

$$\begin{array}{r} 9 - 7 = 2 \\ 1 - 6 = -5 = -10 + 5 \\ -1 + 0 - 5 = -6 = -10 + 4 \\ -1 + 2 - 4 = -3 = -10 + 7 \\ -1 + 8 - 3 = 4 \\ 1 - 2 = -1 = -10 + 9 \\ -1 + 0 - 1 = ? \end{array}$$



Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \phantom{00} \phantom{00} \overset{-1}{\phantom{0}} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 \phantom{00} \phantom{00} \overset{-1}{\phantom{0}} \phantom{00} \overset{-1}{\phantom{0}} \phantom{00} \overset{-1}{\phantom{0}} \phantom{00} \\
 \phantom{00} \phantom{00} \overset{-1}{\phantom{0}} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 \hline
 \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00}
 \end{array}$$

- Ensure summand > subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6 = -10 + 4 \\
 -1 + 2 - 4 &= -3 = -10 + 7 \\
 -1 + 8 - 3 &= 4 \\
 1 - 2 &= -1 = -10 + 9 \\
 -1 + 0 - 1 &= -2
 \end{aligned}$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \text{---} \quad \text{---1} \quad \text{---1} \quad \quad \text{---1} \quad \text{---1} \quad \text{---1} \\
 \quad 2 \quad 0 \quad 1 \quad 8 \quad 2 \quad 0 \quad 1 \quad 9 \\
 \quad \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \\
 \hline
 \quad \quad \text{?} \quad 9 \quad 4 \quad 7 \quad 4 \quad 5 \quad 2
 \end{array}$$

- Ensure summand > subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6 = -10 + 4 \\
 -1 + 2 - 4 &= -3 = -10 + 7 \\
 -1 + 8 - 3 &= 4 \\
 1 - 2 &= -1 = -10 + 9 \\
 -1 + 0 - 1 &= -2 = -10 + ?
 \end{aligned}$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \\
 \quad \text{2} \quad \text{0} \quad \text{1} \quad \text{8} \quad \text{2} \quad \text{0} \quad \text{1} \quad \text{9} \\
 \quad \quad \text{1} \quad \text{2} \quad \text{3} \quad \text{4} \quad \text{5} \quad \text{6} \quad \text{7} \\
 \hline
 \quad \quad \text{8} \quad \text{9} \quad \text{4} \quad \text{7} \quad \text{4} \quad \text{5} \quad \text{2}
 \end{array}$$

- Ensure summand > subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6 = -10 + 4 \\
 -1 + 2 - 4 &= -3 = -10 + 7 \\
 -1 + 8 - 3 &= 4 \\
 1 - 2 &= -1 = -10 + 9 \\
 -1 + 0 - 1 &= -2 = -10 + 8
 \end{aligned}$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \begin{array}{ccccccc}
 -1 & -1 & & -1 & -1 & -1 & \\
 2 & 0 & 1 & 8 & 2 & 0 & 1 & 9 \\
 - & & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\
 \hline
 & & 8 & 9 & 4 & 7 & 4 & 5 & 2
 \end{array}
 \end{array}$$

- Ensure summand  
> subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6 = -10 + 4 \\
 -1 + 2 - 4 &= -3 = -10 + 7 \\
 -1 + 8 - 3 &= 4 \\
 1 - 2 &= -1 = -10 + 9 \\
 -1 + 0 - 1 &= -2 = -10 + 8
 \end{aligned}$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \text{---} \quad \text{---1} \quad \text{---1} \quad \quad \text{---1} \quad \text{---1} \quad \text{---1} \\
 \quad 2 \quad 0 \quad 1 \quad 8 \quad 2 \quad 0 \quad 1 \quad 9 \\
 \quad \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \\
 \hline
 \quad \quad 8 \quad 9 \quad 4 \quad 7 \quad 4 \quad 5 \quad 2
 \end{array}$$

- Ensure summand > subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6 = -10 + 4 \\
 -1 + 2 - 4 &= -3 = -10 + 7 \\
 -1 + 8 - 3 &= 4 \\
 1 - 2 &= -1 = -10 + 9 \\
 -1 + 0 - 1 &= -2 = \text{---}10 + 8
 \end{aligned}$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \text{---} \quad \textcolor{red}{-1} \quad -1 \quad \quad -1 \quad -1 \quad -1 \\
 \textcolor{red}{2} \quad 0 \quad 1 \quad 8 \quad 2 \quad 0 \quad 1 \quad 9 \\
 \quad \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \\
 \hline
 \textcolor{red}{?} \quad 8 \quad 9 \quad 4 \quad 7 \quad 4 \quad 5 \quad 2
 \end{array}$$

- Ensure summand > subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6 = -10 + 4 \\
 -1 + 2 - 4 &= -3 = -10 + 7 \\
 -1 + 8 - 3 &= 4 \\
 1 - 2 &= -1 = -10 + 9 \\
 -1 + 0 - 1 &= -2 = \textcolor{red}{-10} + 8 \\
 \textcolor{red}{-1} + \textcolor{red}{2} - 0 &= \textcolor{red}{?}
 \end{aligned}$$

Subtract 1234567 from 20182019.

$$\begin{array}{r}
 \text{---} \quad \textcolor{red}{-1} \quad -1 \quad \quad -1 \quad -1 \quad -1 \\
 \quad \textcolor{red}{2} \quad 0 \quad 1 \quad 8 \quad 2 \quad 0 \quad 1 \quad 9 \\
 \quad \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \\
 \hline
 \quad \textcolor{red}{1} \quad 8 \quad 9 \quad 4 \quad 7 \quad 4 \quad 5 \quad 2
 \end{array}$$

- Ensure summand > subtracand.

$$\begin{aligned}
 9 - 7 &= 2 \\
 1 - 6 &= -5 = -10 + 5 \\
 -1 + 0 - 5 &= -6 = -10 + 4 \\
 -1 + 2 - 4 &= -3 = -10 + 7 \\
 -1 + 8 - 3 &= 4 \\
 1 - 2 &= -1 = -10 + 9 \\
 -1 + 0 - 1 &= -2 = \textcolor{red}{-10} + 8 \\
 \textcolor{red}{-1} + \textcolor{red}{2} - 0 &= \textcolor{red}{1}
 \end{aligned}$$