

### **Infix to postfix**

$((1+2)-(3-4))/(6-5) \rightarrow 1\ 2\ +\ 3\ 4\ -\ -\ 6\ 5$

Step 1

Empty stack

Empty postfix

Step 2

Cur = (

Push (

Stack = [(

Postfix = empty

Step 3

Cur = (

Push (

Stack = [(, (

Postfix = empty

Step 4

Cur = (

Push (

Stack = [(, (, (

Postfix empty

Step 5

Cur = 1

Write operand to postfix

Stack = [(, (, (

Postfix = "1"

Step 6

Cur = +

Push +

Stack = [(, (, (+

Postfix = "1"

Step 7

Cur = 2

Write operand to postfix

Stack = [(, (, (

Postfix = "12"

Step 8

Cur = )

Pop + and write to postfix

Pop ( and throw away

Stack = [ (, [ ]

Output = "12+"

Step 9

Cur = -

Push -

Stack = [ (, (, - ]

Postfix = "12+"

Step 10

Cur = (

Push (

Stack = [ (, (, -, [ ]

Postfix = "12+"

Step 11

Cur = 3

Push 3

Stack = [ (, (, -, [ ]

Postfix = "12+3"

Step 12

Cur = -

Push -

Stack = [ (, (, -, (, - ]

Postfix = "12+3"

Step 13

Cur = 4

Write operand to postfix

Stack = [ (, (, -, (, - ]

Postfix = "12+34"

Step 14

Cur = )

Pop - and write to postfix  
Pop ( and discard  
Stack = [(, (, -]  
Postfix = "12+34-"

Step 15  
Cur = )  
Pop - and write to postfix  
Pop ( and discard  
Stack = [(]  
Postfix = "12+34-"

Step 16  
Cur = /  
Push /  
Stack = [(, /]  
Postfix = "12+34-"

Step 17  
Cur = (  
Push (  
Stack = [(, /, (  
Postfix = "12+34-"

Step 18  
Cur = 6  
Write operand to postfix  
Stack = [(, /, (  
Postfix = "12+34-6"

Step 19  
Cur = -  
Push -  
Stack = [(, /, (, -]  
Postfix = "12+34-6"

Step 20  
Cur = 5  
Write operand to postfix  
Stack = [(, /, (, -]

Postfix = "12+34-65"

Step 21

Cur = )

Pop - and write to postfix

Pop ( and discard

Stack = [(, /]

Postfix = "12+34-65-"

Step 22

Cur = )

Pop / and write to postfix

Pop ( and discard

Stack = empty

Postfix = "12+34-65-/"

### **Evaluating postfix:**

1 2 + 3 4 - - 6 5 - /

Step 1

Stack is empty

Step 2

Cur = 1

Push 1

Stack = [1]

Step 3

Cur = 2

Push 2

Stack = [1, 2]

Step 4

Cur = +

Pop 2 -> right

Pop 1 -> left

Eval 1+2=3

Push 3

Stack = [3]

Step 5

Cur = 3

Push 3  
Stack = [3, 3]

Step 6  
Cur = 4  
Push 4  
Stack = [3, 3, 4]

Step 7  
Cur = -  
Pop 4 -> right  
Pop 3 -> left  
Eval  $3-4=-1$   
Push -1  
Stack = [3, -1]

Step 8  
Cur = -  
Pop -1 -> right  
Pop 3 -> left  
Eval  $3 - -1 = 4$   
Push 4  
Stack = [4]

Step 9  
Cur = 6  
Push 6  
Stack = [4, 6]

Step 10  
Cur = 5  
Push 5  
Stack = [4, 6, 5]

Step 11  
Cur = -  
Pop 5 -> right  
Pop 6 -> left  
Eval  $6-5=1$   
Push 1

Stack = [4, 1]

Step 12

Cur = /

Pop 1 -> right

Pop 4 -> left

Eval  $4/1=4$

Push 4

Stack = [4]

Final answer is 4