

## Infix to Postfix

Infix Expression :  $A^* (B^* C + D^* E) + F ;$

S.No	Current Token	Operator stack	Postfix String
1.	A		A
2.	*	*	A
3.	(	* (	A
4.	B	* (	A B
5.	*	* ( *	A B .
6.	(	* ( *	A B C
7.	+	* ( +	A B C *
8.	D	* ( +	A B C * D
9.	*	* ( + *	A B C * D
10.	E	* ( + *	A B C * D E .
11.	)	*	A B C * D E * +
12.	+	+	A B C * D E * + *
13.	F	+	A B C * D E * + * F
14.			A B C * D E * + * F +

Postfix Expression is :  $A B C ^* D E ^* + ^* F + .$

2. Infix Expression:  $A^* B^* C + D$

	Stack	Output	Input	Result
1			A	A
2	*	*		*A
3	B			AB
4	^			AB
5	C			ABC
6	+			ABC^*
7	D			ABC^*D^
8				ABC^*D^

Postfix Expression:  $ABC^*D^+$

+ is not a terminal symbol

3. Postfix to Infix.

Postfix Expression :  $AB - DE + F * /$

S.No	Reading of postfix	Stack top	Expression
1	A	A	$A$
2	B	B	$B$
3	-	$A - B$	$A - B$
4	D	D	$D$
5	E	E	$E$
6	+	$D + E$	$D + E$
7	F	F	$F$
8	*	$(D + E) * F$	$(D + E) * F$
9	/	$(A - B) / ((D + E) * F)$	

Infix Expression:  $(A - B) / ((D + E) * F)$

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postfix Conversion:  $abc^*de-/+$ 

SNo	Symbol	Stack
1	a	a
2.	b	ab
3.	c	abc
4	*	$a(b*c)$
5	d	$a(b*c)d$
6.	e	$a(b*c)de$
7.	-	$a(b*c)(d-e)$
8	/	$a(b*c)/(d-e)$
9	+	$(a + (b*c) / (d-e))$

Infix conversion:  $(a + (b*c) / (d-e))$

5. Balanced Symbols:

$$((a+b)^* (c-d))$$

Step	Symbol	Stack	Action Taken	Expression so far
1	(	(	push '('	(
2	(	((	push '('	((
3	a	((a	Append 'a'	((a
4	+	((a+	Append '+'	((a+
5	b	((a+b	Append 'b'	((a+b
6	)	((a+b)	POP 'c'	((a+b)
7	*	((a+b)*	push '*'	((a+b)*
8	(	((a+b)* (	push '('	((a+b)* (
9	c	((a+b)* (c	Append 'c'	((a+b)* (c
10	-	((a+b)* (c -	Append '-'	((a+b)* (c -
11	d	((a+b)* (c - d	Append 'd'	((a+b)* (c - d
12	)	((a+b)* (c - d)	POP 'c'	((a+b)* (c - d)
13	)		POP 'c'	((a+b)* (c - d))

It is valid for 'Balanced Symbol'.

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$$\therefore [(a+b)^* c \beta - d]$$

S.No.	Symbol	Stack	Action Taken	Expression so far
1	(	[( ]	push ' ( '	(
2	a	[( ]	Append 'a'	(a
3	+	[(, + ]	push '+'	(a +
4	b	[(, + ]	Append 'b'	(a+b
5	)	[(, + ]	POP 'c'	(a+b)
6	*	[(, +, * ]	push '*'	(a+b)*
7	c	[(, +, * ]	Append 'c'	(a+b)* c
8	)	[( ]	POP 'c'	(a+b)* c
9	-	[(, - ]	push '-'	(a+b)* c -
10	d	[(, - ]	Append 'd'	(a+b)* c - d
11	End	∅	POP remaining operators	(a+b)* c - d

It is valid for "Balanced Symbol"