

"STACK EXPRESSION"

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1. Infix to Prefix.

$K + L - M * N + (O ^ P) * W / U / V ^ * . T + Q$

Reverse Expression:-

$Q + T * V / U / W ^ *) P ^ * Q (+ N * M - L + K$

Input Expression	Stack	Prefix Expression
Q	empty	Q
+	+	QT
T	+	QT
*	+*	QTV
V	+*	QTV
/	+*/	QTVU
U	+*/	QTVU
/	+*///	QTVUW
W	+*///	QTVUW
*	+*///*	QTVUW
)	+*///*)	QTVUWP
P	+*///*)	QTVUWP
^	+*///*)^	QTVUWP
Q	+*///*)^	QTVUWPQ
(+*///*	QTVUWPQ^
+	++	QTVUWPQ^*//*
N	++	QTVUWPQ^*Y1*N
*	++*	QTVUWPQ^*Y1*N
M	++*	QTVUWPQ^*Y1*N
-	++-	QTVUWPQ^*Y1*N

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Input Ex Stack

L	++-
+	++-+
K	++-+
empty	

Prefix Expression

QTVUWPO^{^*/1*}NM*L
 QTVUWPO^{^*/1*}NM*L
 QTVUWPO^{^*/1*}NM*LK
QTVUWPO^{^*/1*}NM*LK+ -#

Now Reverse the Final Expression
 Infix to Prefix is:

+ - + K L * M N * / / ^ ^ D P W U V T Q

2- Infix to Postfix

K + L - M * N + (O ^ P) * W / U / V * T + Q

Input Expression

K

+

L

-

M

X

N

+

(

O

^

P

)

Stack Prefix Expression

empty

+

+

-

-

*

-

+

+

)

+

^

+

+

K

KL

KL+

KL+

KL+M

KL+M

KL+MN

KL+MN*-

KL+MN*-

KL+MN*-O

KL+MN*-O

KL+MN*-OP

KL+MN*-OP^

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Input Expression	Stack	Prefix Expression
*	+*	KL + MN * - OP ^
W	+*	KL + MN * - OP ^ W
/	+ /	KL + MN * - OP ^ W *
U	+ /	KL + MN * - OP ^ W * U
/	+ /	KL + MN * - OP ^ W * U /
V	+ /	KL + MN * - OP ^ W * U / V
*	+ *	KL + MN * - OP ^ W * U / V *
T	+ *	KL + MN * - OP ^ W * U / V / T
+	+	KL + MN * - OP ^ W * U / V / T +
Q	+	KL + MN * - OP ^ W * U / V / T + Q +

Postfix expression is :-

$KL + MN * - OP ^ W * U / V / T * + Q +$

3- Infix Expression :-

$A + (B * C - (D / E ^ F) * G) * H$, where $^$ is an exponential operator.

Symbol	Scanned	Stack	Postfix Expression	Description
1				Start
2	A	(A	
3	+	(+	A	
4	((+ (A	
5	B	(+ (I	AB	
6	*	(+ (* I	AB	
7	C	(+ (* C	ABC	
8	-	(+ (- I	ABC *	$\leftarrow (*)$ is a lighter precedence than $-$)
9	((+ (- (ABC *	
10	D	(+ (- (D	ABC * D	

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Symbol	Scanned	Stack	Postfix Expression	Description
11	/	(+(-/)	A B C * D	
12	E	(+(-/	A B C * D E	
13	^	(+(-/^	A B C * D E ^	
14	F	(+(-/^	A B C * D E F	
15)	(+(-	A B C * D E F)	Pop from stack
16	*	(+(-*	A B C * D E F ^ /	Pop on stack
17	G	(+(-*	A B C * D E F ^ / G	
18)	(+	A B C * D E F ^ / G * -	
19	*	(+ *	A B C * D E F ^ / G * -	
20	H	(+ *	A B C * D E F ^ / G * - H	
21)	empty.	A B C * D E F ^ / G * - H * +	End

Resultant Postfix Expression

A B C * D E F ^ G * - H * +

4- Expression Evaluation :-

"Postfix Expression
Evaluation"

5 3 2 * + 4 - 5 +

② Input so far

5 3 2 * + 4 - 5 +

5

③ Input so far

5 3 2 * + 4 - 5 -

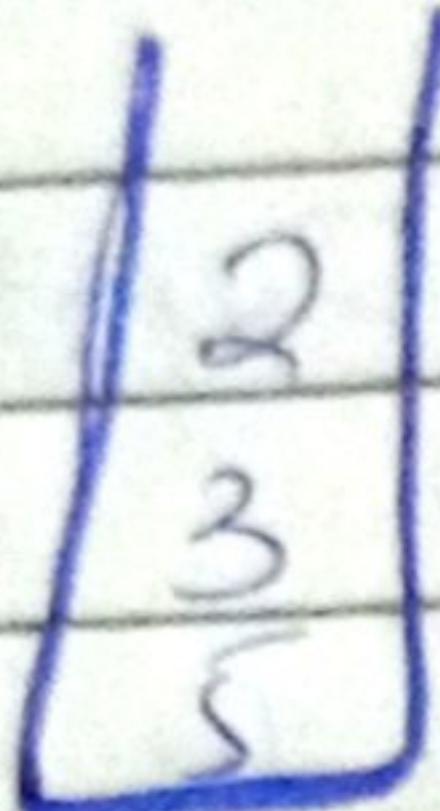
3
5

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(c)

Input so far

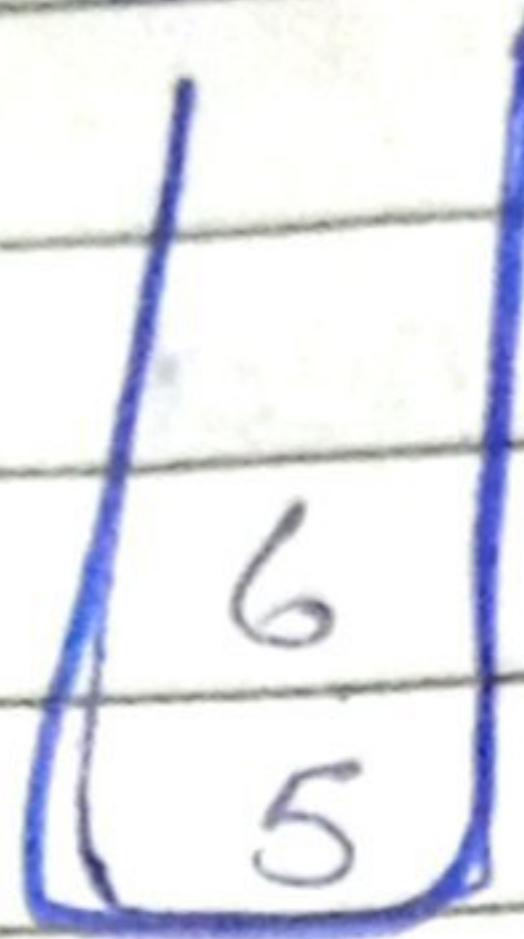
$$532 * 4 - 5 +$$



(d)

Input so far

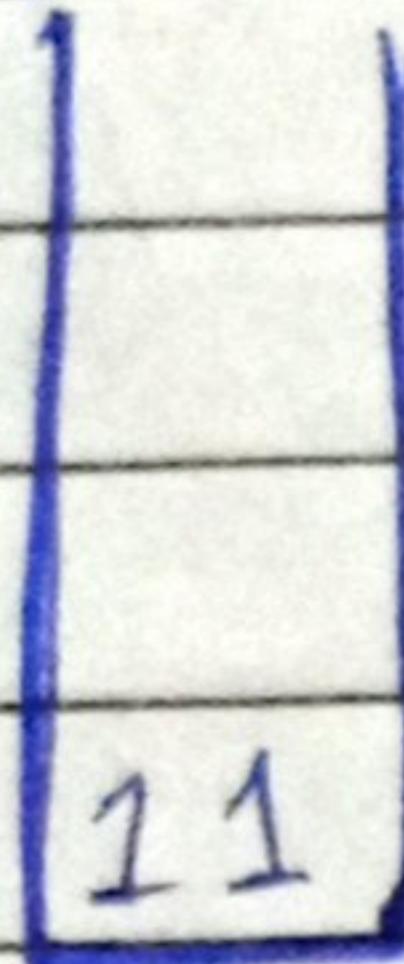
$$532 * 4 - 5 -$$



(e)

Input so far

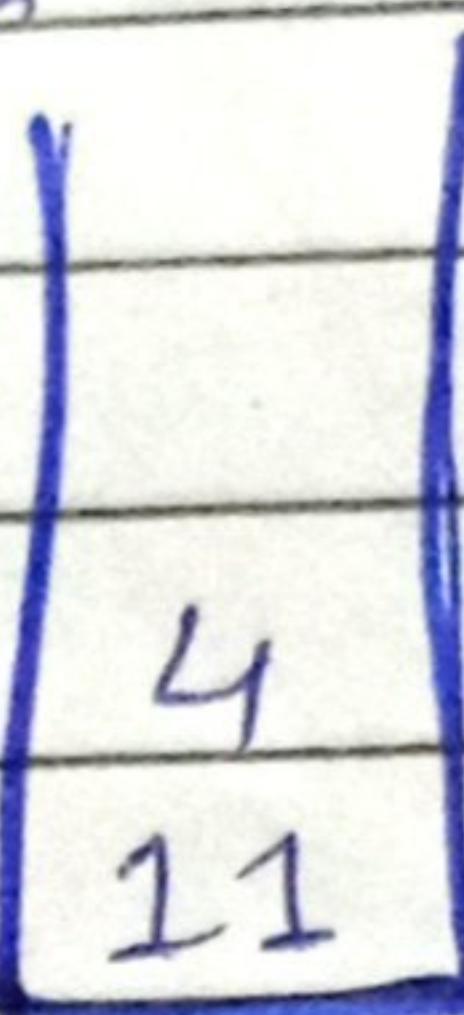
$$532 * 4 - 5 +$$



(f)

Input so far

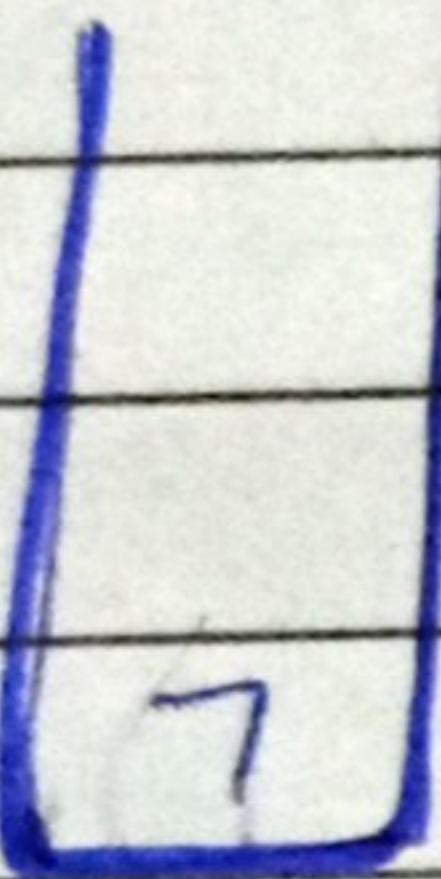
$$532 * 4 - 5 -$$



(g)

Input so far

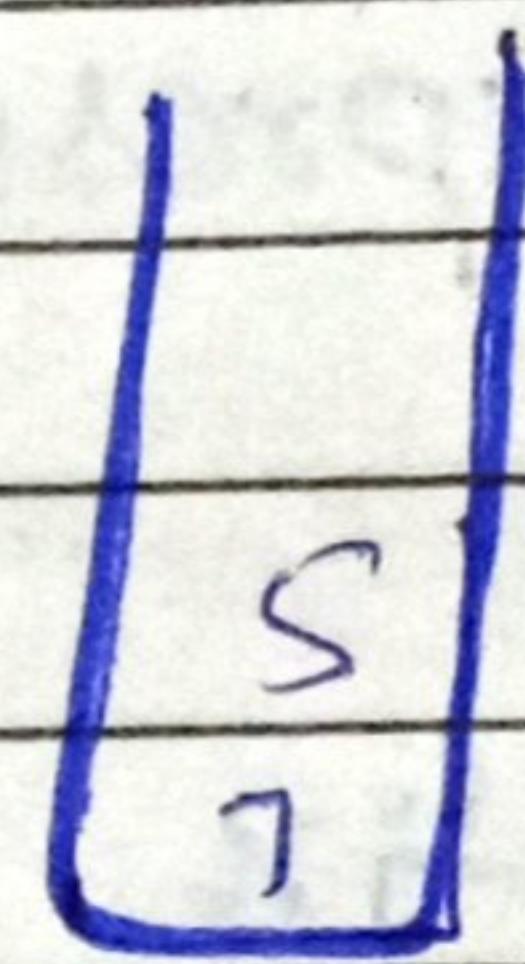
$$532 * 4 - 5 +$$



(h)

Input so far

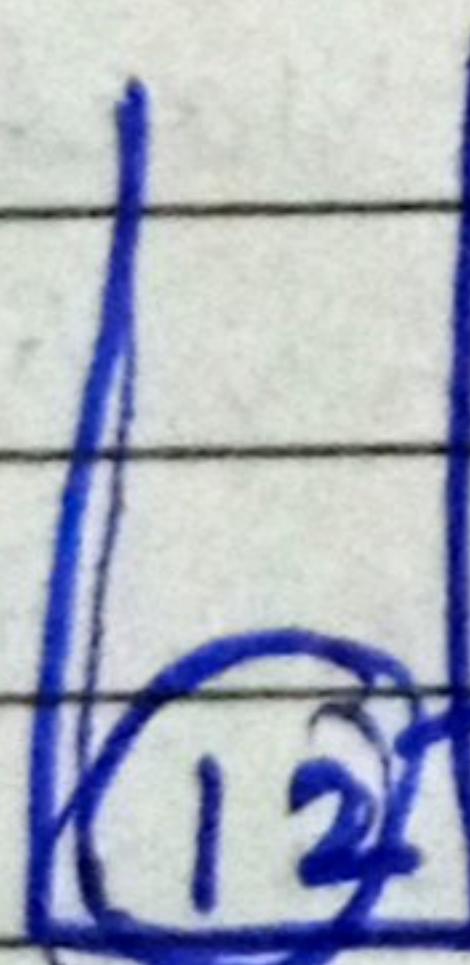
$$532 * 4 - 5 -$$



(i)

Input so far

$$532 * 4 - 5 +$$



The result of the computation is 12

→ Expression :- $+9 * 26$

② Prefix Expression Evaluation
Reverse 62 * 9 +

Character Scanned	Stack	Explanation
6	6	6 is an operand push to stack
2	62	2 is an operand push to stack
*	(2 6*2)	* is an operator pop 6 up & multiply
9	12 9	9 is operand push to stack
+	21(12+9)	+ is an operator pop 12 and 9 add them up push to stack

③ Expression

$$- * + 582 / 62$$

Prefix	Stack	Description
- * + 582 / 62	2	Push 2 to stack
- * + 582 / 6	2, 6	Push 6 to stack
- * + 582 /	3	Pop stack $v_1 = 6$
		Pop stack $v_2 = 2$
		Push $v_1/v_2 (3)$ to stack
- * + 582	3, 2	Push 2 to stack
- * + 58	3, 2, 8	Push 8 to stack
- * + 5	3, 2, 8, 5	Push 5 to stack
- * +	3, 2, 13	Pop stack

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Prefix

Stack

Description

 $-*$

3, 26

 $v_1 = 5$

Pop stack

 $v_2 = 8$ Push $v_1 + v_2 (13)$

to stack

to stack

Pop stack

 $v_1 = 13$

Pop stack

 $v_2 = 2$ Push $v_1 * v_2 (26)$

to stack

Pop stack

 $v_2 = 3$ Push $v_1 - v_2 (23)$

to stack

 $-$

23

Result = 23