

Infix to Postfix using Stack

① $a + b - c * d / e - f + g * h.$

Infix	Stack	Postfix
a		a
+	+	a
b	+	ab
-	-	ab+
c	-	ab+c
*	*	ab+c
d	*	ab+cd
/	/	ab+cd*
e	/	ab+cd*e
-	-	ab+cd*e/-
f	-	ab+cd*e/-f
+	+	ab+cd*e/-f-
g	+	ab+cd*e/-f-g
*	*	ab+cd*e/-f-g
h.	+	ab+cd*e/-f-gh
		ab+cd*e/-f-gh*+

3.33

$= ab + cd * e / - f - gh * +$

$= 2 + 3 - 4 * 5 / 6 - 7 + 8 * 9.$

$= 5 - 3.33 - 7 + 72.$

$= 70 - 3.33$

$= 66.67$

Q $a * b - c * d + e - f + g * h$

infix	stack	Postfix
a		a
*	*	a
b	*	ab
-	-	ab*
c	-	ab*c
*	*	ab*c
d	*	ab*cd
+	+	ab*cd*
e	+	ab*cd*e
-	-	ab*cd*-e+
f	-	ab*cd*-e+f
+	+	ab*cd*-e+f-
g	+	ab*cd*-e+f-g
*	*	ab*cd*-e+f-g
h	*	ab*cd*-e+f-g
	+	ab*cd*-e+f-g*+

= $ab*cd*-e+f-g*+$

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

$6 - 20 + 6 - 7 + 72$

= 57

③ $a + b * c * d / (e * f) * g + h.$

infix	stack	Postfix
a		a
+	+	a
b	+	ab
*	+	ab
c	+	abc
*	+	abc*
d	+	abc*d
/	/	abc*d*
(+ / c	abc*d*
e	+ / c	abc*d*e
*	+ / c *	abc*d*e
f	+ / c *	abc*d*ef
)	/	abc*d*ef*
*	+	abc*d*ef*/
g	+	abc*d*ef*/g
+	+	abc*d*ef*/g*+
h.	+	abc*d*ef*/g*+h.
		abc*d*ef*/g*+h+

= $abc*d*ef*/g*+h+$

= $2+3 \times 4 \times 5 / (6 \times 7) \times 8 + 9$

$2 + 60 / 336 + 9$

= $11.17 \times$

④ $a+b-(c \times d)-e-f+g-h$

infix	stack	Postfix
a		a
+	+	a
b	+	ab
-	-	ab+
(-(ab+
c	-(ab+c
*	-(*	ab+c
d	-(*	ab+cd
)	-	ab+cd*
-	-	ab+cd*-
e	-	ab+cd*-e
-	-	ab+cd*-e-
f	-	ab+cd*-e-f
+	+	ab+cd*-e-f-
g	+	ab+cd*-e-f-g
-	-	ab+cd*-e-f-g+
h	-	ab+cd*-e-f-g+h
		ab+cd*-e-f-g+h-

$$= ab+cd*-e-f-g+h-$$

$$= 2+3-(4 \times 5)-6-7+8-9$$

$$5-20-6-10$$

$$= 1$$

⑤ $a + (b + c) * d / e + f / g * h$

Infix	Stack	Postfix
a	.	a
+	+	a
(+(a
b	+(ab
+	+(+	ab
c	+(+	abc
)	+	abc+
*	+	abc+
d	+	abc+d
/	/	abc+d*
e	+	abc+d*e
+	+	abc+d*e/
f	+	abc+d*e/+f
/	/	abc+d*e/+f
g	/	abc+d*e/+fg
*	+	abc+d*e/+fg/
h.	+	abc+d*e/+fg/h
		abc+d*e/+fg/h+

= $abc + d * e / + fg / h +$

= $2 + (3 + 4) * 5 / 6 + 7 / 4 * 9$

$2 + 35 / 13 / 72$

= 0.03 \checkmark