Worksheet: Expression Conversion and Evaluation

Instructions:

1. Solve the following problems based on the specific conversion or evaluation technique mentioned.
2. Ensure all steps are shown for conversions and evaluations.
3. For evaluation problems, use the provided operator precedence.

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Section A: Infix to Postfix Conversion

Convert the following fully parenthesised infix expressions to postfix notation:

1. $((A + B) \times (C - D)) + ((E \div F) + G)$
2. $((X + Y) \div (P \times Q)) - (R + (S - T))$
3. $((M \div N) + (O \times P)) \times ((Q - R) \div S)$
4. $(((A + B) \times C) - (D \div E)) + ((F \times G) - H)$
5. $((W - X) + (Y \times Z)) - ((P \div Q) \times R)$

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Section B: Infix to Prefix Conversion

Convert the following fully parenthesised infix expressions to prefix notation:

1. $((A + (B \times C)) - (D \div E)) \times (F + G)$
2. $(H + (I \div J)) \times ((K - L) \div M)$
3. $((N \times O) + (P \div Q)) \div ((R - S) + T)$
4. $((U + V) \times (W - X)) - (Y \div Z)$
5. $(((A \times B) + C) - (D \div E)) + ((F - G) \times H)$

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Section C: Evaluation of Postfix Expressions

Evaluate the following postfix expressions. Assume the values of operands as: $A = 2, B = 3, C = 4, D = 5, E = 6, F = 7, G = 8, H = 9, I = 10$

1. $AB + CDE - \times$
2. $AB + CD - \times EF + /$
3. $AB + CDEF + / - \times$
4. $ABC \div + DE - F \times +$
5. $ABC + \times DEF - \div +$

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Section D: Prefix to Postfix Conversion

Convert the following prefix expressions to postfix notation:

1. $+ \times AB - CD$
2. $\times + AB \div CD$
3. $- + A \times BC \div DE$
4. $\div \times + ABC - DE$
5. $+ \times - ABC \div DE$