

You Name:

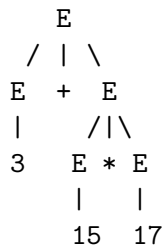
1. Given a BNF $E ::= N|E + E$, where N stands for all integer numbers, which of the following is a correct **derivation** ?

- (a) $E \Rightarrow N + N \Rightarrow 3 + 5$ (b) $E \Rightarrow E + E \Rightarrow 3 + 5$ (c) $E \Rightarrow E + E \Rightarrow 3 + E \Rightarrow 3 + 5$

2. Given a BNF $E ::= N|E + E$, where N stands for all integer numbers, which of the following is a correct **parse tree** ?

- (a)
$$\begin{array}{c} E \\ / \quad \backslash \\ 3 \quad 5 \end{array}$$
- (b)
$$\begin{array}{c} E \\ / \quad \backslash \\ E \quad E \end{array}$$
- (c)
$$\begin{array}{c} E \\ / \quad | \quad \backslash \\ 3 \quad + \quad 5 \end{array}$$
- (d)
$$\begin{array}{c} E \\ / \quad | \quad \backslash \\ E \quad + \quad E \\ | \quad \quad | \\ 3 \quad \quad 5 \end{array}$$

3. Given a BNF $E ::= N|E + E|E * E$, where N stands for all integer numbers, Find the correct AST for the following **parse tree**.



- (a)
$$\begin{array}{c} E \\ / \quad | \quad \backslash \\ 3 \quad + \quad E \\ \quad \quad / \quad \backslash \\ \quad \quad 15 * 17 \end{array}$$
- (b)
$$\begin{array}{c} + \\ / \quad \backslash \\ 3 \quad * \\ \quad \quad / \quad \backslash \\ \quad \quad 15 \quad 17 \end{array}$$
- (c)
$$\begin{array}{c} * \\ / \quad \backslash \\ + \quad 17 \\ / \quad \backslash \\ 3 \quad 15 \end{array}$$
- (d)
$$\begin{array}{c} + \\ / \quad \backslash \\ E \quad * \\ | \quad \quad / \quad \backslash \\ 3 \quad E * E \\ \quad \quad | \quad | \\ \quad \quad 15 \quad 17 \end{array}$$