CS320 Assignment 5
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KEY:

==Highlight== = next nonterminal to derive
- For rightmost derivation, the rightmost nonterminal will always be highlighted
- For leftmost derivation, leftmost nonterminal always highlighted

<u>Underline</u> = derivation result of the previous ==highlighted== nonterminal

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1. **Goal: 12 + 2 * –07** *using rightmost derivation*
   a. ==\<expr>==
   b. <u>\<expr> *</u> ==\<expr>==
   c. \<expr> * ==\<int>==
   d. \<expr> * <u>–==\<nat>==</u>
   e. \<expr> * –<u>\<digit></u>==\<nat>==
   f. \<expr> * –\<digit>==\<digit>==
   g. \<expr> * –==\<digit>==<u>7</u>
   h. ==\<expr>== * –<u>0</u>7
   i. <u>\<expr> +</u> ==\<expr>== * –07
   j. \<expr> + ==\<int>== * –07
   k. \<expr> + ==\<nat>== * –07
   l. \<expr> + ==\<digit>== * –07
   m. ==\<expr>== + <u>2</u> * –07
   n. ==\<int>== + 2 * –07
   o. ==\<nat>== + 2 * –07
   p. <u>\<digit></u>==\<nat>== + 2 * –07
   q. \<digit>==\<digit>== + 2 * –07
   r. ==\<digit>==<u>2</u> + 2 * –07
   s. <u>1</u>2 + 2 * –07

(Problem 2 on next page so that it can all be on one page)

2. **Goal: for x = –12 to 10 do { y = 0; pass }** *using leftmost derivation*
    a. <stmt>
    b. for <ins><id></ins> = <expr> to <expr> do <stmt>
    c. for <ins>x</ins> = <expr> to <expr> do <stmt>
    d. for x = <ins><int></ins> to <expr> do <stmt>
    e. for x = –<ins><nat></ins> to <expr> do <stmt>
    f. for x = –<ins><digit></ins><ins><nat></ins> to <expr> do <stmt>
    g. for x = –<ins>1</ins><nat> to <expr> do <stmt>
    h. for x = –1<ins><digit></ins> to <expr> do <stmt>
    i. for x = –1<ins>2</ins> to <expr> do <stmt>
    j. for x = –12 to <ins><int></ins> do <stmt>
    k. for x = –12 to <ins><nat></ins> do <stmt>
    l. for x = –12 to <ins><digit></ins><ins><nat></ins> do <stmt>
    m. for x = –12 to 1<ins><nat></ins> do <stmt>
    n. for x = –12 to 1<ins><digit></ins> do <stmt>
    o. for x = –12 to 1<ins>0</ins> do <stmt>
    p. for x = –12 to 10 do { <ins><stmts></ins> }
    q. for x = –12 to 10 do { <ins><stmt> ; <stmts></ins> }
    r. for x = –12 to 10 do { <ins><id></ins> = <expr> ; <stmts> }
    s. for x = –12 to 10 do { <ins><letter></ins> = <expr> ; <stmts> }
    t. for x = –12 to 10 do { <ins>y</ins> = <expr> ; <stmts> }
    u. for x = –12 to 10 do { y = <ins><int></ins> ; <stmts> }
    v. for x = –12 to 10 do { y = <ins><nat></ins> ; <stmts> }
    w. for x = –12 to 10 do { y = <ins><digit></ins> ; <stmts> }
    x. for x = –12 to 10 do { y = <ins>0</ins> ; <stmts> }
    y. for x = –12 to 10 do { y = 0 ; <ins><stmt></ins> }
    z. for x = –12 to 10 do { y = 0 ; <ins>pass</ins> }