In order to do the following exercises assume:

- The expression $x+y$ is represented as (PLUS x y). The expression $xy+x+3$ is represented as (PLUS (TIMES x y) x 3)

- The list ((A B) (B A C D) (C B D E) (D B C E) (E C D F) (F E)) is used to represent the following graph according to a scheme whereby there is a sublist for each vertex consisting of the vertex itself followed by the vertices to which it is connected.
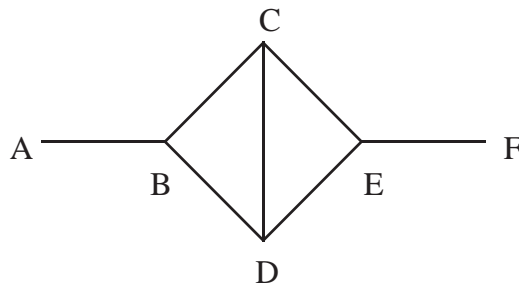
1. If we represent sums and products as indicated above and use (MINUS X), (QUOTIENT X Y), and (POWER X Y) as representations of $-x$, x/y, and x^y respectively, then

    (a) What do the lists

        (QUOTIENT 2 (POWER (PLUS X (MINUS Y)) 3))

    and

        (PLUS -2 (MINUS 2) (TIMES X (POWER Y 3.3)))

    represent?

    (b) How are the expressions $xyz+3(u+v)^{-3}$ and $(xy-yx)/(xy+yx)$ to be represented?

2. In the above mentioned graph notation, what graph is represented by the list
    ((A D E F) (B D E F) (C D E F) (D A B C) (E A B C) (F A B C))?

3. Write the list (PLUS (TIMES X Y) X 3) as an s-expression. This is sometimes referred to as "dot-notation."

4. Write the following s-expressions in list notation to whatever extent is possible:

    (a) (A . NIL)
    (b) (A . B)
    (c) ((A . NIL) . B)
    (d) ((A . B) . ((C . D) . NIL))