Lumber from Trees

You have an 8-foot section of a tree, that has been debarked. The tree has a diameter of 3 feet. How many 2x4's can you cut from this tree?

Solve this by making a carefully-measured drawing, or through mathematical reasoning.

Optional variations: Do this for 2x6's, and 2x8's as well.

Algebraic variation: Do this for a tree of radius r, and boards of size 2 by x.

Show your work, and write your answer in a complete sentence.