

HOW TO GET BASIC TREE VALUES QUICKLY WITHOUT “PI”

by Francis W. Holmes

Abstract. 1. Measure your tree's girth *in inches*. 2. Square that number. 3. Multiply by \$1.75. You now have the Basic Value! Then diminish, as you always do, by site, health, etc.

The Felt-Spicer formula, used by I.S.A., C.T.L.A., and many others, uses the *area*, in square inches, of a trunk cross-section at breast height (4 feet 6 inches, or 1.5 meters). But town tree surveys, often carried out by citizen volunteers, usually report linear measurement, that is to say, *girth* (circumference) instead of area. Also the American Forestry Association's "Social Register of Big Trees" uses girth (in inches, at breast height) as the most important of the three measurements that determine a national champion for each native tree species. Of course, for each tree you measure, you **could**: (A) divide the circumference (girth) by [pi] to get the diameter; then, (B) divide the diameter by 2 to get the radius; then, (C) square the radius; then, (D) multiply the squared radius by [pi] again, to get the cross-sectional area; and then, (E) multiply the area by \$22.00, to get the basic value. Thereafter, each tree's value is diminished according to judgments that are unique to that particular tree and its circumstances.

However, so long as the value remains at \$22 per square inch, you can get the correct Felt-Spicer basic value by the three quick steps in the abstract, above.

For math buffs, here's the proof, based on what you learned in algebra. Let "G" be the girth you measured, in inches.

(A) Diameter is girth divided by pi:

$$\frac{G}{\pi}$$

(B) Radius is half the diameter:

$$\frac{G}{2\pi}$$

(C) Now, square the radius:

$$\frac{G}{2\pi} \quad \frac{G}{2\pi}$$

(D) Area ("A") is pi times this (πr^2):

$$A = \frac{G}{2\pi} \cdot \frac{G}{2\pi} (\pi)$$

(E) Basic tree value ("V") is \$22 times this:

$$V = \frac{G}{2\pi} \cdot \frac{G}{2\pi} (\$22\pi)$$

(F) Simplify into one fraction:

$$V = \frac{\$11 G^2}{2\pi}$$

(G) Substitute 3 1/7 for pi:

$$V = \frac{\$11 G^2}{(2)(3 \frac{1}{7})}$$

(H) Make the denominator into one fraction:

$$V = \frac{\$11 G^2}{44/7}$$

(I) To divide by 44/7 is to multiply by 7/44:

$$V = (\$11 G^2) (7/44) = \frac{77G^2}{44}$$

(J) Divide both numerator & denominator by 11:

$$V = \frac{\$7 G^2}{4} = \$1.75 G^2$$

So, just **square the girth and multiply by one and three-quarters dollars!** Your computer inventory software should be easily adjusted to do this automatically, yielding a "basic" value in dollars whenever you enter a girth for a tree. *Director, Shade Tree Laboratories, University of Massachusetts, Amherst.*