

PROBLEM-OF-THE-DAY: ALGEBRA 1**WEEK:** October 8 to October 12**DAY:** Thursday

RISD Objective: Given a figure (including composite figures) and/or a word problem, students will find the perimeter or circumference, applying it as necessary.

PROBLEM #37

If a tree grows a $\frac{1}{4}$ -inch-thick ring each year for the first 60 years, $\frac{1}{3}$ -inch-rings for the next 80 years, and $\frac{1}{2}$ -inch-rings for the next 200 years, what are the circumferences of a 125-year-old tree and a 184-year-old tree?



MODEL SOLUTION #37

To find the circumference for a 125-year old tree, we first need to find the radius for the first 60 years of $\frac{1}{4}$ and then find the radius for other 65 years of $\frac{1}{3}$. That is:

$$\left(\frac{1}{4}\right)(60) = 15 \quad \text{The radius of a 60-year-old tree is 15 inches}$$

$$\left(\frac{1}{3}\right)(65) = 21.7$$

So,

$$15 + 21.7 = 36.7$$

Therefore, the radius of a 125-year-old tree is 36.7 inches. So, the circumference would be $2\pi r$, which is $2(3.14)(36.7) = 230.5$ inches

Now to find the circumference of a 184-year-old-tree, we need to find the radius for the 60 years of $\frac{1}{4}$, 80 years of $\frac{1}{3}$ and only 44 years of $\frac{1}{2}$.

$$\left(\frac{1}{4}\right)(60) = 15$$

$$\left(\frac{1}{3}\right)(80) = 26.7$$

$$\left(\frac{1}{2}\right)(44) = 22$$

$$\text{So, } 15 + 26.7 + 22 = 63.7$$

Therefore, the radius of a 184-year-old tree is 63.7 inches. So, the circumference would be $2\pi r$, which is $2(3.14)(63.7) = 400.0$ inches.