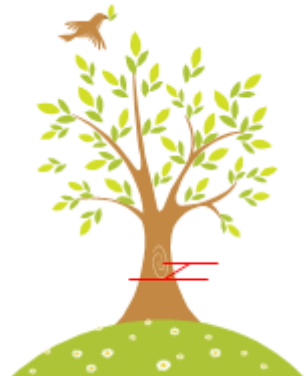


The number π

- 1) Choose any tree you like.
- 2) Measure the perimeter of the trunk of that tree. Record the result in the table below.
- 3) Measure the diameter of the tree through the distance between two parallel tangents. Record the result.
- 4) Divide the perimeter by the diameter and record the result.
- 5) Repeat the procedure with other trees.



Teacher: Cândida Barros

Tree	Perimeter	Diameter	Perimeter/Diameter
1			
2			
3			
4			

As you can observe, the quotient of the perimeter by the diameter is always the same (approximately, since the section of a tree is not a perfect circumference). This quotient is called **Pi**.

Pi is a Greek letter, correspondent to the letter P (from perimeter) and is written π .

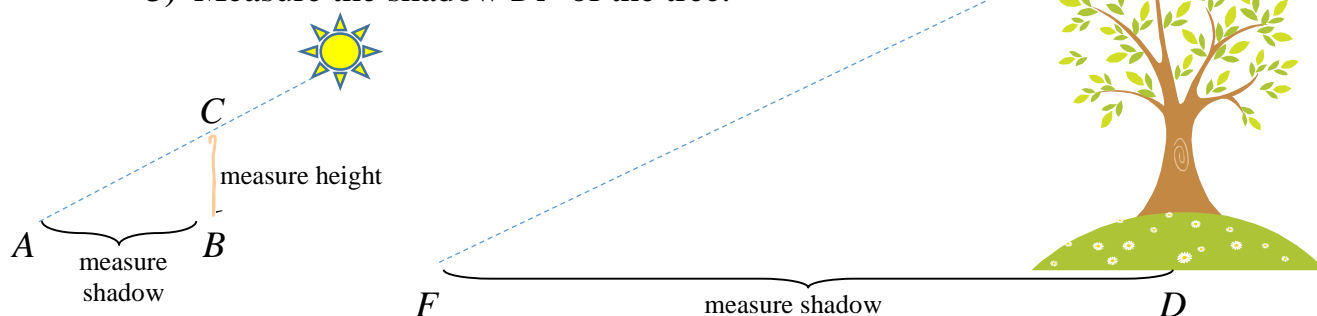
The number π has infinite decimal places, which present no regularity. If you had a calculator that showed 1000 digits, you would get the following result:

3.141592653589793238462643383279502884197169399375105820974944592307816406286208
9986280348253421170679821480865132823066470938446095505822317253594081284811174502841
0270193852110555964462294895493038196442881097566593344612847564823378678316527120190
9145648566923460348610454326648213393607260249141273724587006606315588174881520920962
8292540917153643678925903600113305305488204665213841469519415116094330572703657595919
5309218611738193261179310511854807446237996274956735188575272489122793818301194912983
3673362440656643086021394946395224737190702179860943702770539217176293176752384674818
4676694051320005681271452635608277857713427577896091736371787214684409012249534301465
4958537105079227968925892354201995611212902196086403441815981362977477130996051870721
134999998372978049951059731732816096318595024459455346908302642522308253344685035261
9311881710100031378387528865875332083814206171776691473035982534904287554687311595628
638823537875937519577818577805321712268066130019278766111959092164201989

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How to determine the height of a tree

- 1) Measure the shadow \overline{AB} of a stick and its height \overline{BC} .
- 2) Choose any tree you like.
- 3) Measure the shadow \overline{DF} of the tree.

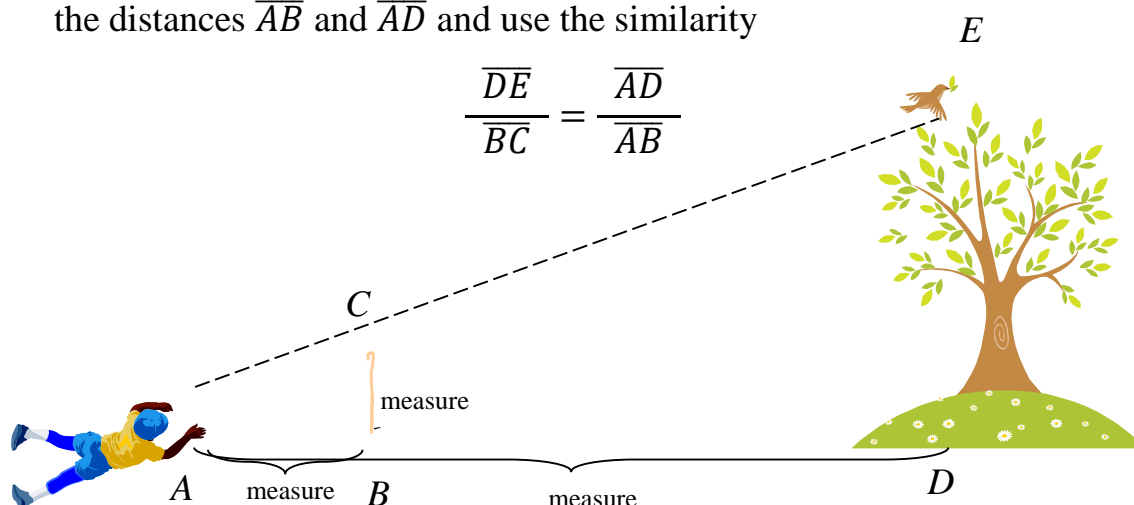


- 4) Note that, since $[ABC]$ and $[FDE]$ are right triangles and the angles at A and F are the same, then they are similar and

$$\frac{\overline{DE}}{\overline{BC}} = \frac{\overline{FD}}{\overline{AB}}$$

- 5) Determine the height \overline{DE} of the tree.
- 6) If there is no shadow, you can align the points A , C and E , measure the distances \overline{AB} and \overline{AD} and use the similarity

$$\frac{\overline{DE}}{\overline{BC}} = \frac{\overline{AD}}{\overline{AB}}$$



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