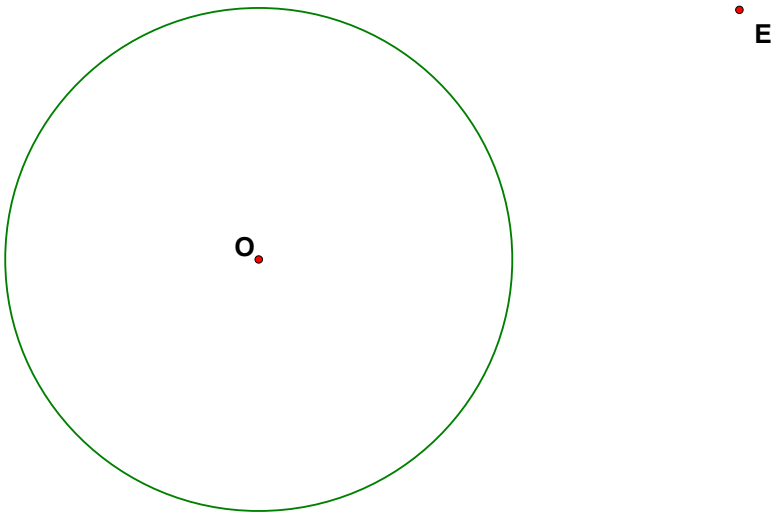
## *Construction Portfolio Part 2*

Carry out these constructions, each one on a separate side of paper.

13. **External Tangents.**

Draw any circle c; label the center O and the radius r. Then draw a point E outside the circle. Construct two points S and T on the circle so that ES and ET are tangent to c. Construct F as the intersection of ST and OE.

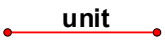



Answer this: Let OE = d and let the radius of the circle be r. At the bottom of the page, compute the length OF as an expression in d and r.

14. **Right Triangle from Hypotenuse.** Draw a segment AB and a point D on AB. Construct a point C so that ABC is a right triangle with hypotenuse AB, and D is the foot of the altitude through C.


Let x = |AD| and y = |BD|, then if h = |CD|, write h as an expression in x and y

15. Geometric Mean. Draw a segment of unit length. Then construct a segment of length sqrt 7, using Construction 14 as the method.



16. **Half-Area.** Draw a triangle ABC. Construct points E on AB and F on AC so that EF is parallel to BC and area AEF = (1/2) area ABC.