

Instructions for constructing a regular 17-gon.

This construction is due to H. W Richmond in 1892 [and quoted from Dummit and Foote's "Abstract Algebra" 3rd edition, pg. 604 and 605].

- (a) Draw the x -axis and mark the points $(0, 1)$, $(2, 0)$ and $(4, 0)$.
- (b) Draw a circle of radius 2 centered at the origin.
- (c) Draw the line through $(4, 0)$ and $(0, 1)$.
- (d) Construct the line ℓ_1 that bisects the angle made by $(0, 0)$, $(0, 1)$ and $(4, 0)$.
- (e) Construct the line ℓ_2 perpendicular to ℓ_1 that goes through $(0, 1)$.
- (f) Draw the circle C_1 with center the intersection of ℓ_1 and the x -axis, that goes through $(0, 1)$.
- (g) Let $A = (s, 0)$ be the right-most intersection of C_1 with the x -axis. (Warning: A is really close to $(2, 0)$, but just to the right of it).
- (h) Draw the circle C_2 with the center the intersection of ℓ_2 and the x -axis, that goes through $(0, 1)$.
- (i) Let $B = (t, 0)$ be the right-most intersection of C_2 with the x -axis.
- (j) Draw perpendicular to the x -axis at A , and draw a circle of radius t centered at A . These intersect at the point (s, t) .
- (k) Draw a circle with diameter the line segment between $(0, 1)$ and (s, t) .
- (l) Let P denote the right-most intersection of this circle with the x -axis.
- (m) Draw a perpendicular to the x -axis at P . The intersection of this line with the circle of radius 2 is the second vertex of the 17-gon (with the first vertex at $(2, 0)$).
- (n) Draw the rest of the vertices by repeatedly drawing circles of radius equal to the distance between P and $(2, 0)$.