

# W14 Stepwise

Due date: Thursday 4/16, 11:59pm

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## Polar curve - Vertical or horizontal tangent lines

Find all points on the given curve where the tangent line is horizontal or vertical.

$$r = \cos \theta \quad \theta \in [0, 2\pi)$$

Hint: First determine parametric Cartesian coordinate functions using  $\theta$  as the parameter.

**✍ Sketching roses**

Sketch the graphs of the following polar functions.

Use numbers to label the *order* in which the leaves/loops are traversed.

(a)  $r = \sin 2\theta$     (b)  $r = \sin 3\theta$     (c)  $r = 2 \cos 2\theta$

✍ **Polar coordinates - lunar areas**

(a) Find the area of the green region.

(b) Find the area of the yellow region.

(You can find these in either order.)

