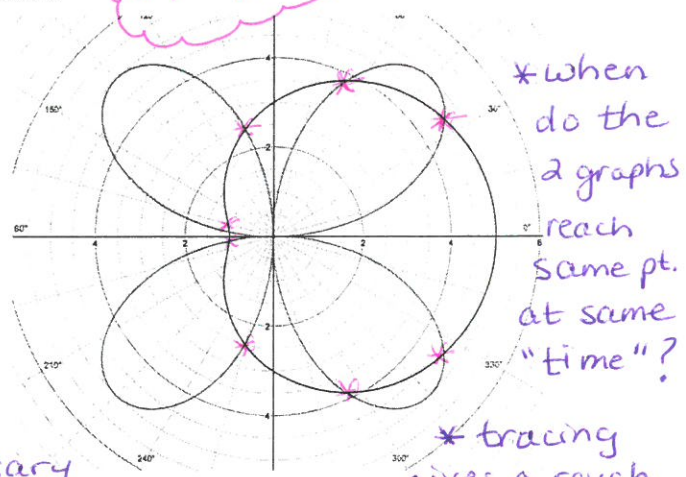


Notes 13.3 Intersections of Polar Curves

1. Find the intersection points of the limaçon  $r = 3 + 2 \cos \theta$  and the four-petal rose  $r = 5 \sin 2\theta$

\* polar mode



\* when do the 2 graphs reach same pt. at same "time"?

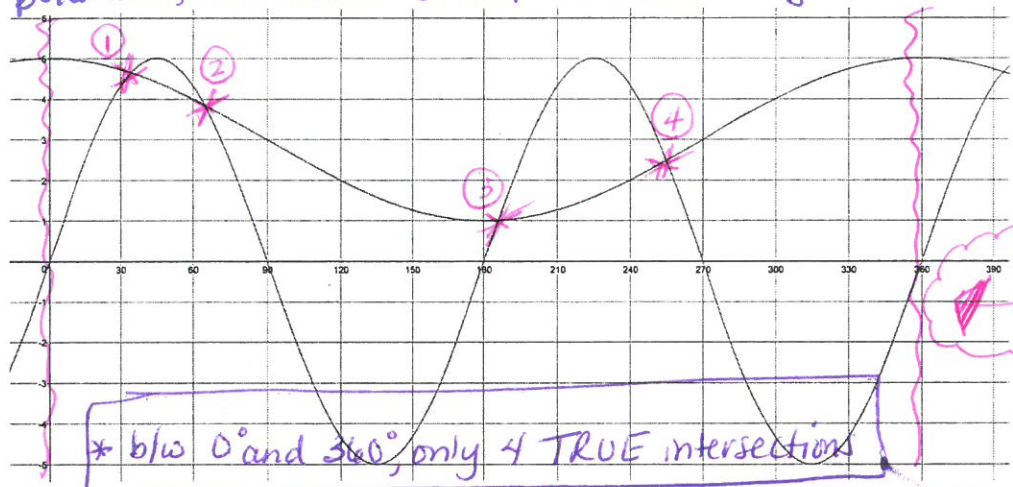
\* tracing gives a rough estimate of the pts. of intersection

- appears there are 8

Graph using: polar mode  
degree mode  
polar GC (format)  
appropriate window  
simultaneous mode

Hint: when graphing

in polar mode, slow down  $\theta$  step if necessary

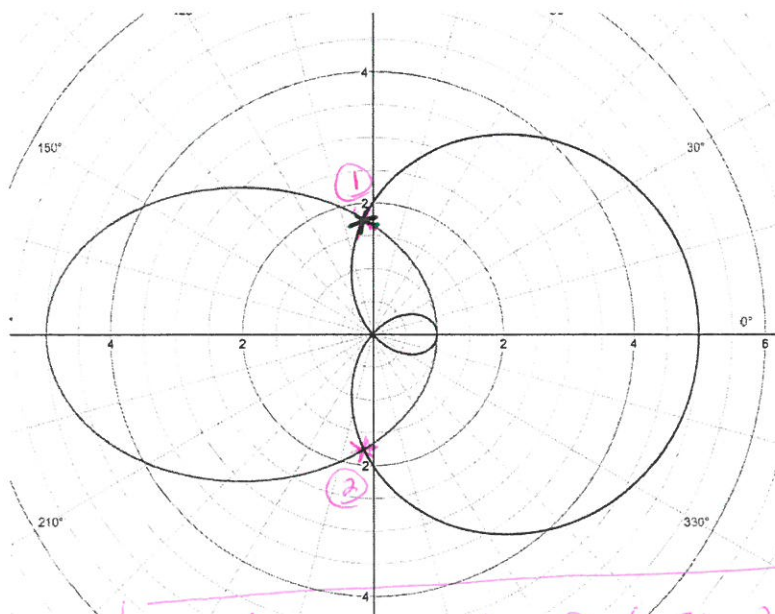


\* b/w 0° and 360°, only 4 TRUE intersections

function mode

- \*  $y = r$
- \*  $x = \theta$
- \* shows true intersections
- \* allows calc. of intersections for accuracy
- ① (4.65, 34.26°)
- ② (3.85, 64.81°)
- ③ (1.01, 185.83°)
- ④ (2.49, 255.10°)

2. limaçon  $r = 2 + 3 \cos \theta$  and ellipse  $r = \frac{5}{3+2 \cos \theta}$



① (1.76, 94.58°)    ② (1.76, 265.42°)