

What day of the month is your birthday ?

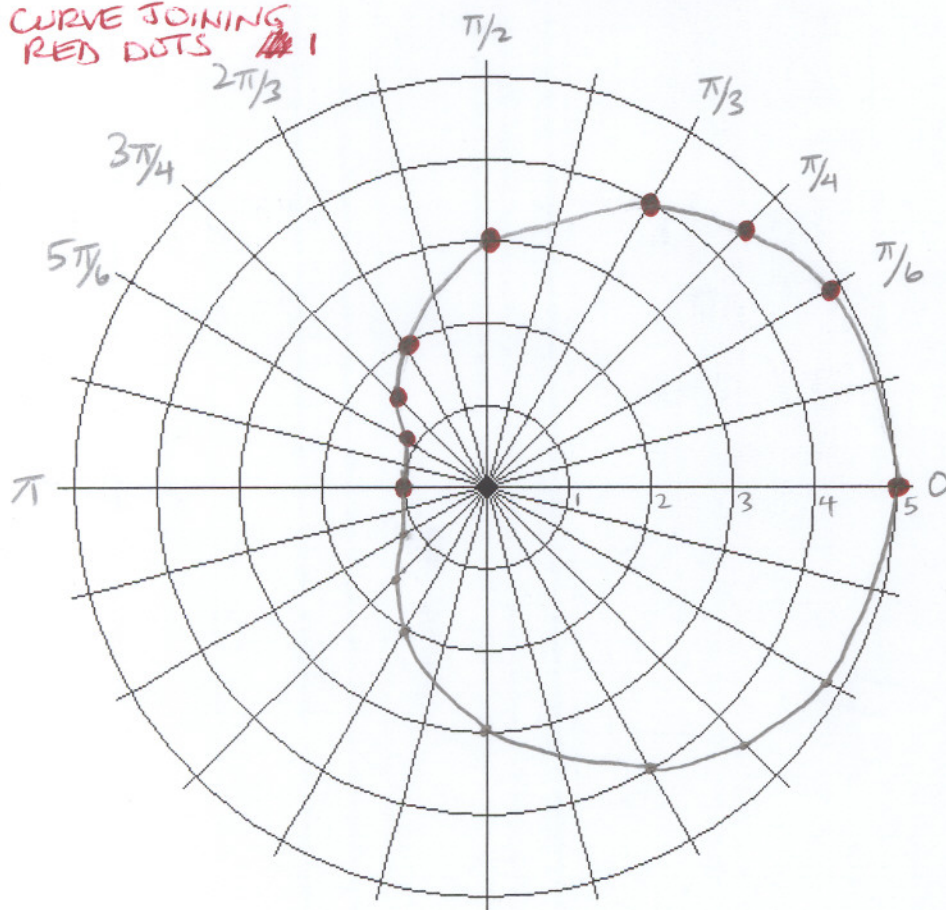
What are the last 2 digits of your address ?

What are the last 2 digits of your zip code ?

What are the last 2 digits of your social security number ?

[IF YOU DO NOT HAVE A SOCIAL SECURITY NUMBER,
USE YOUR STUDENT ID NUMBER]**NO CALCULATORS ALLOWED**Draw the polar graph $r = 3 + 2 \cos \theta$. You must run symmetry tests, and use the results to calculate the least number of points required.- RED DOTS 2
- CURVE JOINING
RED DOTS 1

- REFLECTION 2



θ	r
0	5
$\pi/6$	4.8
$\pi/4$	4.4
$\pi/3$	4
$\pi/2$	3
$2\pi/3$	2
$3\pi/4$	1.6
$5\pi/6$	1.2
π	1

SUBTRACT $\frac{1}{2}$ POINT FOR
EACH UNNECESSARY θ, r
PAIRSYMMETRY $\theta = 0$ (AXIS)

① $r = 3 + 2 \cos(-\theta)$

$r = 3 + 2 \cos \theta$

SYMMETRIC

 $\theta = \pi/2$

① $-r = 3 + 2 \cos(-\theta)$

$-r = 3 + 2 \cos \theta$

$r = -3 - 2 \cos \theta$

② $r = 3 + 2 \cos(\pi - \theta)$

$r = 3 - 2 \cos \theta$

NO CONCLUSION
ON BOTH TESTSPOLE

① $-r = 3 + 2 \cos \theta$

$r = -3 - 2 \cos \theta$

② $r = 3 + 2 \cos(\pi + \theta)$

$r = 3 - 2 \cos \theta$

NO CONCLUSION
ON BOTH TESTSNEED $\theta \in [0, \pi]$

SUBTRACT 1 POINT EACH TIME YOU WROTE "NOT SYMMETRIC"