Notes 13.2 Continued

Graphs of Polar Equations

A limacon is a figure with polar equation

$r = a + b\cos\theta$ or $r = a + b\sin\theta$

If a < b, then it has an inner loop $r = 1 + 2cos\theta$
If a > b, then it has **no** inner loop $r = 3 + 2cos\theta$
If a = b, then it is heart shaped **(cardioid)** $r = 1 - sin\theta$

$r = 2\cos(2\theta)$ example of a **rose** ***If** number next to θ is even, then 2n petals.
$r = 6\sin(5\theta)$ If number next to θ is odd, then n petals.

Convert equations from Polar to Cartesian form.

1. r = 4

2. $r = 6\cos\theta$

3. $r = -4\cos\theta$

4. $r = 2\sin\theta$

5. $r\sin\theta = 3$

6. $r\cos\theta = 7$

7. $r = \frac{9}{5-4\cos\theta}$

8. $r = \frac{9}{4+5\cos\theta}$