Summary of Polar Circles

- Circles always move counterclockwise
- The circle completes itself from 0 to π.
- Going from 0 to 2π would retrace the original circle
- The number in front of sine is the radius

- Equations with positive sine start at the origin and then move counterclockwise up
- Equations with negative sine start at the origin and then move counterclockwise down

- Equations with positive cosine start at the radius on the positive side of the pole and then move counterclockwise up and back toward the origin
- Equations with negative cosine start at the radius on the negative side of the pole and then move counterclockwise down and back toward the origin

Summary of the Cardiod: $r = \pm a \pm b\cos\theta$

- For a polar equation to be considered a cardiod, the values of $|a|$ and $|b|$ must be the same.
- Plug in $\theta = 0$. This will give you the value of r and where you will start moving counterclockwise.
- The value of **a** will tell you where the curve is at on the y-axis (when $\theta = \frac{\pi}{2}$ and $\theta = \frac{3\pi}{2}$)
- To complete the entire shape $0 \le \theta \le 2\pi$
- The value of $|a| + |b|$ will tell you how far out on the x-axis the curve is
- If b is negative the curve will be on the left side of the pole
- If b is positive the curve will be on the right side of the pole

Summary of the Cardiod: $r = \pm a \pm b\sin\theta$

- For a polar equation to be considered a cardiod, the values of $|a|$ and $|b|$ must be the same.
- Plug in $\theta = 0$. This will give you the value of r and where you will start moving counterclockwise.
- The value of **a** will tell you where the curve is at on the x-axis (when $\theta = 0$ and $\theta = \pi$)
- To complete the entire shape $0 \le \theta \le 2\pi$
- The value of $|a| + |b|$ will tell you how far out on the y-axis the curve is
- If b is negative the curve will be below the pole
- If b is positive the curve will be above the pole