Limaçon Curve

LimaconCurve.tns

Name _____

Class _____

Problem 1 – Limaçon Curve

Polar curves called limaçons have equations of the form $r = a \pm b \sin(\theta)$ or $r = a \pm b \cos(\theta)$. On page 1.3 are special kinds of limaçon graphs called cardioids. Use the up/down arrows to see all of the graphs.

1. Why do you think the graphs on page 1.3 are called cardioids?

2. On page 1.3, what similarities do you notice about the equations of the graphs?

3. How do the addition and subtraction signs affect the graph?

4. On page 1.8, how are the equations different from those on page 1.3? How does this difference affect the graph?

5. Use the up/down arrows on page 1.11 to see different graphs of limaçons. How many different shapes can you find? Describe each one you find.

6. On page 1.11, use the up/down arrows to find an equation in which the ratio $\frac{a}{b} < 1$. Record your equation below and describe the shape of the limaçon.

7. On page 1.11, use the up/down arrows to find an equation in which the ratio satisfies $1 < \frac{a}{b} < 2$. Record your equation below and describe the shape of the limaçon.

8. On page 1.11, use the up/down arrows to find an equation in which the ratio $\frac{a}{b} \geq 2$. Record your equation below and describe the shape of the limaçon.