

Math 241 Class Exercise: Curvature
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1. Let C be a circle of radius a . Calculate the curvature. How does the curvature change as a changes? Does this agree with your intuition?
2. For a plane curve the curvature formula reduces to the following:

$$\kappa(x) = \frac{|f''(x)|}{[1 + (f'(x))^2]^{3/2}}. \quad (1)$$

Find the curvature of the parabola $y = x^2$. Using matlab, plot both the parabola and the curvature $\kappa(x)$ on the same graph. Where is the curvature the largest? Does this agree with your intuition?

3. Consider the curvature at $x = 0$ for each member of the family of functions $f(x) = e^{cx}$. For which members is the curvature the largest?