1. Draw a circle with the center at the origin and radius $2\sqrt{2}$.

(a) Write equation of the circle

(b) Check that the point $(2, 2)$ is on the circle and sketch the tangent line to the circle at this point

(c) Compute equation of this tangent line

2. Sketch the graph of the function $f(x) = \sin^2 x$. Show each intermediate graph separately. For each intermediate graph, indicate domain and range. On the graph of $f(x)$ mark at least 4 points where the graph intersects the x-axis. What is the period of $f(x)$?

(Hint: You may use the “double angle formula”: $\sin^2 x = \frac{1 - \cos 2x}{2}$).

3. Bonus. Sketch the graph of the function $f(x) = |\cos(|x|)|$. 