

Quiz # 1 -Answers
Math 142.518

1. [5 pts] What is the domain and range of the function $f(x) = \sqrt{1 - x^2}$.

Solution: Since $1 - x^2$ must be non-negative, $x^2 \leq 1$ so $-1 \leq x \leq 1$. If $y = f(x) = \sqrt{1 - x^2}$ then $y^2 = 1 - x^2$ and $x^2 + y^2 = 1$ so the graph of the function is a semicircle. The range of y is $0 \leq y \leq 1$.

2. [5 pts] Using the appropriate [WINDOW] settings, find the max of the function (to 3 decimals).

Solution: Using the [2nd][Calc][maximum] function, the maximum is equal to 1 (when $x=0$).

3. [5 pts] Use the calculator to find the intersections of the curves $Y_1 = x^2$ and $Y_2 = x + 1$.

Solution: Note that there are **two** intersections. Using [2nd][Calc][intersect], we get the left intersection $x = -.618034$ and $y = .38196601$, and the right intersection $x = 1.618034$ and $y = 2.618034$.

This can also be solved **exactly** by setting Y_1 equal to Y_2 , that is $x^2 = x + 1$ or $x^2 - x - 1 = 0$. The quadratic formula then gives

$$x = \frac{1 \pm \sqrt{5}}{2}$$