# Worksheet IIA

## Pre-calculus Graphing

and

## Crunching of Some Values of a Function at Certain x-values

Dr. M. P. M. M. McLoughlin

Fall 2012

## Questions and Exercises

1. Consider $k : \mathbb{R} \longrightarrow \mathbb{R}$ where

$$k(x) = \begin{cases} 3x + 15, & x < -2 \\ \frac{1}{x-1}, & -2 \leqslant x < 1 \\ 3, & x = 1 \\ \frac{4}{(x+2)^2}, & 1 < x < 3 \\ (x+1)^3, & x \geqslant 3 \end{cases}$$

A. Find the domain of $k$. B. Find the codomain of $k$.
C. Graph $k$. D. Find the range of $k$.

2. Consider $j : \mathbb{R} \longrightarrow \mathbb{R}$ where

$$j(x) = \begin{cases} sin(x), & x < -\frac{\pi}{2} \\ e^x, & -\frac{\pi}{2} \leqslant x \leqslant 0 \\ x^4, & 0 < x \leqslant 2 \\ -2x^2, & 2 < x \end{cases}$$

A. Find the domain of $j$. B. Find the codomain of $j$.
C. Graph $j$. D. Find the range of $j$.

3. Consider $p : \mathbb{R} \longrightarrow \mathbb{R}$ where

$$p(x) = \begin{cases} 5x - 2, & x < -1 \\ \frac{1}{3}, & x = -1 \\ cos(x) & -1 < x < 2 \\ \ln(x), & x \geqslant 2 \end{cases}$$

A. Find the domain of $p$. B. Find the codomain of $p$.
C. Graph $p$. D. Find the range of $p$.

4. Consider $m : \mathbb{R} \longrightarrow \mathbb{R}$ where

$$m(x) = \begin{cases} \arctan(x), & x < \frac{1}{\sqrt{3}} \\ 4x - 8, & x \geqslant \frac{1}{\sqrt{3}} \end{cases}$$

A. Find the domain of $m$. B. Find the codomain of $m$.
C. Graph $m$. D. Find the range of $m$.

5. Consider $q : (0, \infty) \longrightarrow \mathbb{R}$ where

$$q(x) = \begin{cases} \ln(x), & x < 1 \\ \\ 3x - 3, & x \geqslant 1 \end{cases}$$

A. Find the domain of $q$. B. Find the codomain of $q$.
C. Graph $q$. D. Find the range of $q$.

6. Let

$$f(x) = \begin{cases} \frac{x^2-1}{x-1}, & x \neq 1 \\ \\ 3, & x = 1 \end{cases}$$

where $f : \mathbb{R} \longrightarrow \mathbb{R}$
A. Find $f(3)$, $f(2)$, $f(\frac{3}{2})$, $f(\frac{5}{4})$, $f(\frac{9}{8})$, $f(\frac{17}{16})$, $f(1.01)$, $f(1.001)$, and $f(1.0001)$.
B. Find $f(-3)$, $f(\pi)$, $f(\sqrt{2})$, $f(\frac{1}{2})$, $f(\frac{3}{4})$, $f(\frac{63}{64})$, $f(0.99)$, $f(0.999)$, and $f(1)$.