

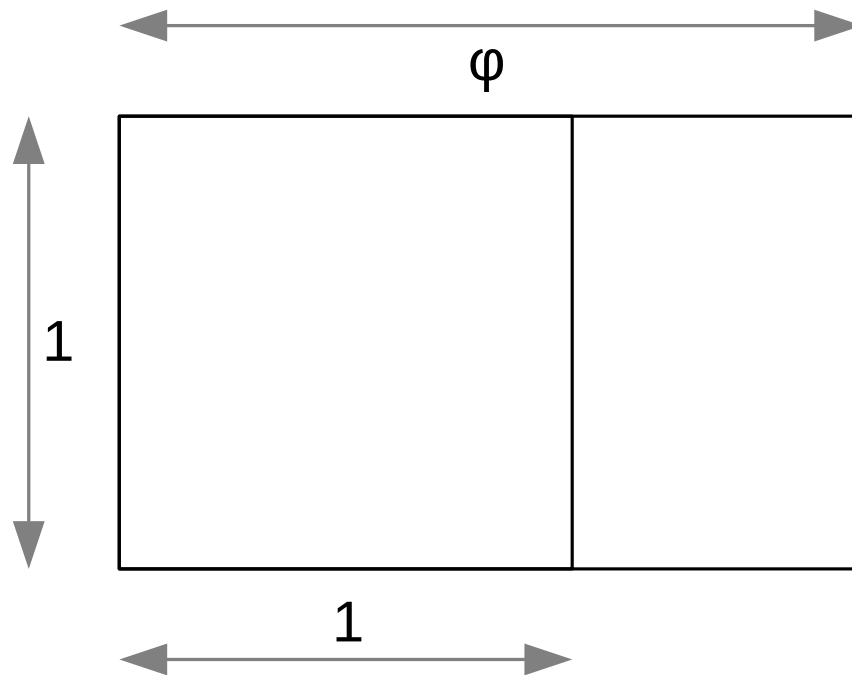
Mathematics 1001H – Precalculus Mathematics

TRENT UNIVERSITY, Summer 2016

Assignment #2

Due on Tuesday, 24 May, 2016.

1. Find three different functions which have domain \mathbb{R} and which are their own inverses (i.e. $(f \circ f)(x) = f(f(x)) = x$ for all $x \in \mathbb{R}$). [3]
2. The “golden ratio”, usually denoted by the lowercase Greek letter phi (which looks like ϕ or φ), is the real number such that if you cut a 1 square from the end of a $1 \times \varphi$ rectangle, the rectangle left over has the same ratio of long side to short side (namely $\frac{\varphi}{1} = \varphi$) as the original rectangle. Use this fact to solve for φ . [4]



NOTE. In classical Greece, these proportions for a rectangle were considered to be the most pleasing possible. The Parthenon in Athens, for example, makes repeated use of such proportions.

3. Find a function $g(x)$ with domain $(0, \infty)$ such that all of
 - i. $g(64) = 6$,
 - ii. $g(x)$ is continuous on its domain, and
 - iii. $g(ab) = g(a) + g(b)$ for all a and b in $(0, \infty)$are true. Is there more than one such function? [3]