University of Texas at Austin

Quiz #3
Prerequisite material.

Provide your **complete solution** to the following problems. Final answers only, without appropriate justification, will receive zero points even if correct.

Problem 3.1. Monotonicity.

   (i) (3 points) Write down the definition of an **increasing** real-valued function whose domain are all nonnegative real numbers.

   (ii) (3 points) Write down the definition of an **decreasing** real-valued function whose domain are all nonnegative real numbers.

Problem 3.2. (1 point) Draw the graph of an *increasing* function.

Problem 3.3. (1 point) Draw the graph of a *decreasing*.

Problem 3.4. (2 points) Draw the graph of a function which is neither decreasing nor decreasing.

Problem 3.5. (5 points) Let the accumulation function be given by

$$a(t) = (1 + 0.05)^{t^2}$$

Then, we can say the following about the continuously compounded, risk-free interest rate r associated with the above accumulation function:

    (a) $r = 0.05$

    (b) $r = 2\ln(1.05)$

    (c) $r = 0.10$

    (d) The continuously compounded, risk-free interest rate is not constant.

    (e) None of the above