

First Midterm Exam for Econ 1530 Section D
York University
11 October 2005

First name:

Last name:

SID number:

Instructions: Write your name and SID number above; circle your answer below, *and* fill out the same answer on the bubble sheet (as well as SID number and name).

Problem 1. A quantity of size 1 grows by 2.37% per year (with annual compounding). After 9 years the quantity has increased to approximately:

- (a) 1.235
- (b) 0.809
- (c) 2.133
- (d) 2.370

Problem 2. The expression $9xz \left(\frac{x}{z} - \frac{8z}{18x} \right)$ can be written as which of the following?

- (a) $(3x - 2z)^2$
- (b) $(3x - 2z)(3x + 2z)$
- (c) $9x - 2z$
- (d) none of the above

Problem 3. If $a < 0$ and $b > 0$, which of these inequalities must be true?

- (a) $a^2 > ab$
- (b) $b^2 < ab$
- (c) $b + a > 0$
- (d) none of the above

Problem 4. Which of the below equations (if any) has the solution $m = \frac{1-\beta-\alpha r}{1-r(1+\alpha)}$?

- (a) $rm + (1 - \alpha r)(1 + m) = \beta$
- (b) $rm + (1 - \alpha r)(1 - m)^2 = \beta$
- (c) $rm + (1 - \alpha r)(1 - m) = \beta$
- (d) none of the above

Problem 5. Let the mean of a population be $\mu_x = \frac{1}{T} \sum_{i=1}^T x_i$, and the sum of the squared deviations from the mean be $S = \sum_{i=1}^T (x_i - \mu_x)^2$. Then S equals:

- (a) $\left(\sum_{i=1}^T x_i^2\right) - T\mu_x^2$
- (b) $\left(\sum_{i=1}^T x_i^2\right) - \mu_x^2$
- (c) $\left[\sum_{i=1}^T (\mu_x - x_i)\right] - T\mu_x$
- (d) $\left(\sum_{i=1}^T x_i^2\right) + \mu_x^2$

Problem 6. Let $f(x) = \frac{(x-1)^2}{x}$. Which one of the below numbers does *not* belong to the domain of f ?

- (a) -2
- (b) -1
- (c) 0
- (d) 1

Problem 7. The graph of the linear function $f(x)$ passes through the points $(x_1, y_1) = (0, -\alpha)$ and $(x_2, y_2) = (\alpha, 2\alpha)$. Which is the function?

- (a) $f(x) = 1 + (1 - \alpha)x$
- (b) $f(x) = 3x - \alpha$
- (c) $f(x) = 1 + cx$
- (d) $f(x) = \alpha - (1 - \alpha)x$

Problem 8. Figure 1 shows the graphs of $y = ax + b$ and $y = cx + d$. Which of the following *must* hold according to the figure?

- (a) $c + d > a + b$
- (b) $a + b > c + d$
- (c) $b + c > a + d$
- (d) $a + d > b + c$

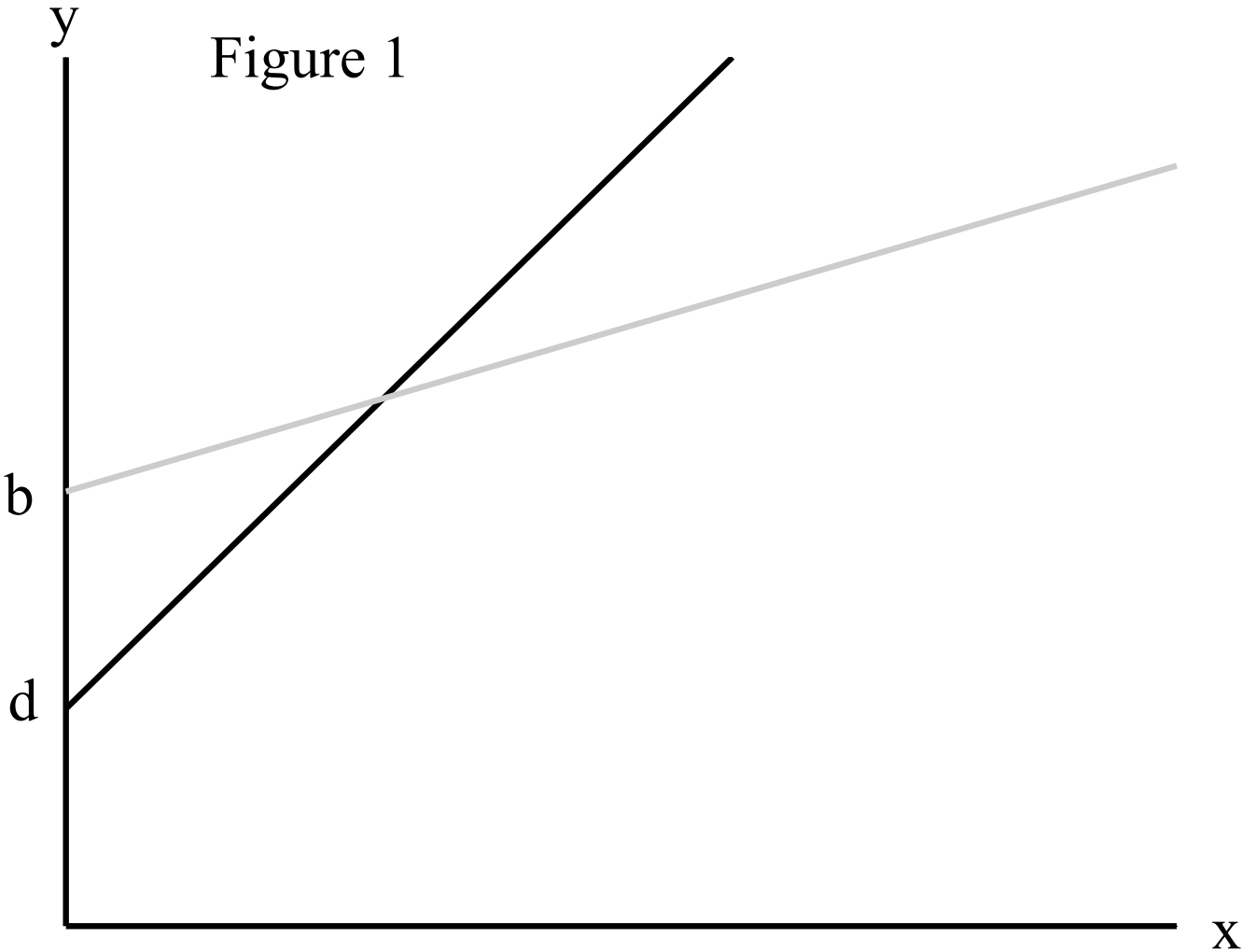
Problem 9: Consider the function $y = 10 - x(x + 2)$. Which of the below best describes the shape of the graph of this function (when drawn in a diagram like that in Figure 1, with y on the vertical axis and x on the horizontal)?

- (a) \cap
- (b) \cup
- (c) \supset
- (d) \subset

Problem 10: Let $f(x) = \frac{e^{(1-\alpha)x}}{A}$, for $A > 0$. Then $f(\ln A)$ equals what of the below?

- (a) $(\ln A) e^{(1-\alpha)A}$
- (b) $A^{1-\alpha}$
- (c) $A^{-\alpha}$
- (d) A^α

Figure 1



Solutions

Problem 1: (a)

Problem 2: (b)

Problem 3: (a)

Problem 4: (c)

Problem 5: (a)

Problem 6: (c)

Problem 7: (b)

Problem 8: (c) Note that $b > d$ can be seen from the figure; $c > a$ follows from understanding which graph refers to which equation. This implies $b + c > a + d$, but not (for example) $c + d > a + b$ or $c + d < a + b$.

Problem 9: (a)

Problem 10: (c)