



Mahidol University International College

MBA Entrance Examination Task II: Mathematics and Statistics Test

November 21st , 2009

NAME _____

SEAT NO. _____

Directions

1. Check that you have 5 pages and 8 problems (including this page) of the examination paper.
2. You are **NOT** allowed to use a calculator.
3. Provide brief justification for your answers in the space provided.
4. You should spend about **60 minutes** on this task.

3. Find all triples (x, y, z) so that

$$\begin{cases} x + y + z = 6 \\ xy + xz = 5 \\ xy + yz = 8 \end{cases}$$

4. If $2 \begin{bmatrix} x \\ y \end{bmatrix} - 4 \begin{bmatrix} 1 \\ 2 \end{bmatrix} = 2 \begin{bmatrix} 0 \\ 1 \end{bmatrix}$, then find $x + y$.

5. If $\begin{bmatrix} 2 & 3 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} 4 & 2 \\ 3 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 4 & 3 \end{bmatrix}$, then find $\det \begin{bmatrix} a & b \\ c & d \end{bmatrix}$.

6. a) If $2^{(2x+1)} = 8^{(x-3)}$, then find the value of $3^{(x-8)}$.

b) If $(555)^x = 8$, and $(555)^y = 2$, then find the value of $(555)^{(x-2y)}$

7. Given $f(x) = 3x^2 - x + 1$.

a) Find $f(m + 1) - f(m) - 2f(0)$.

b) Find the relative maximum or relative minimum of $f(x)$ if there is any.

8. A person wishes to invest \$20,000 in two enterprises so that the total income per year will be \$1,440. One enterprise pays 6% annually; the other has more risk and pays $7\frac{1}{2}\%$ annually. How much must be invested in $7\frac{1}{2}\%$?