NAME ........................................................T utorial Group ......
(Please underline your family name.)

Math130 D1/E1 2003
Assignment 1 Due: Wednesday 19/03/03

Please complete all the details on this page, sign the declaration, and staple this sheet to the front of your solutions.

PLAGIARISM

Plagiarism involves using the work of another person and presenting it as one’s own. For this assignment, the following acts constitute plagiarism:
   a) Copying or summarizing another person’s work.
   b) Where there was collaborative preparatory work, submitting substantially the same final version of any material as another student. Encouraging or assisting another person to commit plagiarism is a form of improper collusion and may attract the same penalties.

STATEMENT TO BE SIGNED BY STUDENT

1) I have read the definition of plagiarism that appears above.

2) In my assignment I have carefully acknowledged the source of any material which is not my own work.

3) I am aware that the penalties for plagiarism can be very severe.

4) If I have discussed the assignment with another student, I have written the solutions independently.

SIGNATURE ......................STUDENT NUMBER ..........

Failure to sign the declaration may result in the assignment being returned unmarked.
Math130 D1/E1 2003 — Assignment 1
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1. Simplify as far as possible each of the following expressions, showing all the steps of your argument carefully:

\[ \frac{1}{x^2 + 4x} - \frac{2}{x^2 - 16} + \frac{4}{x^2 - 4x} \]

2. Factorize each of the following expressions:
   (a) \( x^2 - 3x - 54 \),  (b) \( 81 x^2 y^5 - 3x^5 y^2 \),  (c) \( 3x^2 - 10x + 3 \).

3. Expand and simplify as far as possible each of the following expressions, showing all the steps of your argument carefully:
   (a) \( \left( \frac{2}{x} - \frac{4}{y} \right) \div \left( \frac{3}{x} - \frac{1}{y} \right) \),  (b) \( (5x - 8)^2 + (3x + 7)^2 \).

4. Let \( A = \begin{pmatrix} 3 & 6 \\ 2 & 4 \end{pmatrix} \), \( B = \begin{pmatrix} 6 & 1 \\ 8 & 7 \end{pmatrix} \) and \( C = \begin{pmatrix} 4 & 7 \\ 0 & 5 \end{pmatrix} \). Calculate

   (a) \( 3A - 4B + 6C \)  (b) \( AB - BA \)  (c) \( B(A - C) \)
   
   (d) does \( A \) have an inverse?  (e) \( A^2 \)  (f) \( C^{-1} \)

5. Kim placed an order for 144 gizmos which cost $99. A package of 7 gizmos costs $5, and a package of 9 gizmos costs $6. How many packages of each type did Kim order? The cheapest way of ordering 144 gizmos costs $96. How many packages of each type do you use to get this price?

6. Tabulate the values of \( f(x) \) for each integer \( x \) in the interval \( -1 \leq x \leq 3 \) and draw a sketch of the graph of \( f(x) \) when \( f(x) = \frac{(x^3 - 4x^2 + 5x)}{2} \). Estimate the maximum and minimum values of \( f \).

Read the instructions about assignments in the study guide.