Department of Mathematics

MATH 100, PRECALCULUS
MIDTERM 1

Wednesday February 1, 2006

11.30 – 12.20

Last Name _____

Given Name(s) _____

Student Number _____

Signature _____

INSTRUCTIONS

1. Do **NOT** open this booklet until permission is given.
2. Calculators are **NOT** permitted.
3. Please formulate and motivate your answers.
   Well-phrased and complete explanations are more important than just an answer.
4. If the space provided for the answer is insufficient, please use the back side of the **PREVIOUS** page. Clearly mark which question you are answering in that case.
5. If a question is unclear or appears to contain an error, please ask for clarification.
6. The maximum mark for this exam is 30. In front of each question, the maximal mark for that question is given.
7. This exam consists of **7 PAGES**, a **SCORE PAGE**, and contains a single **PINK** formula sheet.

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1. QUESTION

In this question we consider the line l through the points $(-1, 2)$ and $(3, 10)$.

[2] (a) Compute the slope of the line l.

ANSWER

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[4] (b) Give the slope-intercept form of the line l.

ANSWER

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2. QUESTION

[2] (a) Determine the slope of any line that is perpendicular to the line $y = \frac{3}{4}x+5$. Motivate your answer briefly.

ANSWER

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3. QUESTION

[4] (a) Determine the values of a such that the distance between the points $(-2, 7)$ and $(1, a)$ is 5.

ANSWER

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4. QUESTION

In this question we consider the function f given by $f(x) = -3|x| + 7$.

[4] (a) Draw the graph of f.

ANSWER

[1] (b) Use the graph of f to determine the number(s), if any, at which f has a relative minimum or maximum. What are these minima and/or maxima?

ANSWER

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[1] (c) Determine if f is odd, even or neither. Motivate your answer.

ANSWER

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[2] (d) Solve the inequality $-3|x| + 7 \geq -2$.

ANSWER

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5. QUESTION

[4] (a) Write the circle given by the equation

$$x^2 + y^2 - 4x + 2y - 2 = 0$$

in standard form.

ANSWER

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[2] (b) What is the center of the circle given by $(x + 2)^2 + (y - 3)^2 = 4$?

ANSWER

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6. QUESTION

In this question the functions f and g are given by

$$f(x) = -\frac{2}{x} + 8 \quad \text{and} \quad g(x) = \frac{-2}{x-8}.$$

[2] (a) Verify that $(f \circ g)(x) = x$, for $x \neq 8$.

ANSWER

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[2] (b) Given that also $(g \circ f)(x) = x$ for $x \neq 0$, what is special about f and g?

ANSWER

DO NOT WRITE BELOW THIS LINE

Question	Maximum	Score
1	6	
2	2	
3	4	
4	8	
5	6	
6	4	
Total	30	

Student number