Name _____

Student number_____

MATH 1051 –FA

Final Examination

9:00 am - 12:00 pm

December 10, 2012

Department of Mathematical Science

Dr. S. Ulanov

Instructions:

Answer all questions in the space provided.

If you require additional space use the back of the page but leave the note indicating this to marker.

Problem 1. (6 points) Sketch the graph of the given function.

$$f(x) = \begin{cases} x + 6, & \text{if } x \geq 2 \\ x^2, & \text{if } x < 2 \end{cases}$$

Problem 2. (6 points) Solve the right triangle ABC for the remaining parts if

$$a = 12, \quad A = 30^{o}$$

Problem 3. (7 points) Give the domain of the functions

a) $f(x) = \sqrt{(x - 5)}$ b) $f(x) = \sqrt{(x + 4)}/x^2$

Problem 4. (5 points) Convert each degree measure to radians and each radians measure to degrees.

a) 300^{o} b) $-9\pi/4$

Problem 5. (6 points) If $\cos\theta = 3/7$ and $\tan\theta$ is negative, find the other trigonometric functions.

Problem 6. (4 points) Write the given line in slope-intercept form and in a general form

$$x = -3y + 4$$

Problem 7. (8 points) Solve the given equation

$$\sqrt{(2x + 1)} = x - 7$$

Problem 8. (7 points) Graph the quadratic function. Give all intercepts and vertex.

$$f(x) = 8 - 2t - t^2$$

Problem 9 (8 points) Sketch one cycle of the curve. Give the amplitude A and period p.

$$y = 3\cos 6x$$

Problem 10 (8 points) Solve the equation for x, where $0^o \leq x < 360^o$.

$$\sin 2x - \sqrt{2} \sin x = 0$$

Problem 11 (7 points) Prove the given identity

$$\sin^2 x /(1 - \cos x) = 1 + \cos x$$

Problem 12 (5 points) Find the area of a triangle ABC if $a = 25$, $b = 12$, and $C = 120^{o}$.

Problem 13 (8 points) Solve the given inequalities

a) $|x/3 - 5| < 4$

b) $(x + 3)/(x^2 - 3x + 2) \leq 0$

Problem 14 (8 points) Sketch the graph of the given equation. Find the coordinates of foci, vertices and the centre.

$$36x^2 + y^2 = 36$$

Problem 15 (7 points) Find a parametric representation for the curve given by the equation

$$2x^3 - y^3 = 3xy$$