M17_LE2_002

Mathematics 17 — College Algebra and Trigonometry
Second Long Examination — First Semester, AY 2007-2008

I. Write TRUE if the statement is true. Otherwise, write FALSE.

1. Any graph symmetric with respect to the x and y axes is symmetric with respect to the origin.

2. If the distance between points A and B is equal to the distance between B and C, then B is the midpoint of line segment AC.

3. Any equation of a line defines a function.

4. The line with equation $2x - y + 3 = 0$ is perpendicular to the line defined by $4y - 2x + 5 = 0$.

5. The graph of the equation $x^2 + y^2 - 8x + 10y + 28 = 0$ is a circle with center at (4,-5) and radius 13.

6. $f(x) = x^2 - 4$ is an even function.

II. Do as indicated.

1. Give the solution set of $|1 - 3x| \geq 4$. *(3 pts)*

2. Find the equation of the quadratic function with complex zeros $2 - i$ and $2 + i$. *(3 pts)*

3. The midpoint of A and B (5, -2) is (-2, -3). Find the coordinates of A. *(3 pts)*

4. Given: $f(x) = -x - 4$, and $g(x) = x^2 + 3x - 4$

    (a) Evaluate $(f \circ g)(1)$. *(2 pts)*

    (b) Find $\left(\frac{g}{f}\right)(x)$ and its domain. *(3 pts)*

    (c) Sketch the graph of $f(x)$ and $g(x)$ in one coordinate plane. *(4 pts)*

III. Find the real solution set of the following.

1. $\frac{2}{x+2} = \frac{-x}{x^2+5x+6}$ *(3 pts)*

2. $x^2 + 2x - 1 = 0$ *(3 pts)*

3. $\sqrt{3x + 6} = \sqrt{x + 3} + 1$ *(4 pts)*

4. $(x + 1)^4 + 4(x+1)^2 - 5 = 0$ *(4 pts)*

5. $\begin{cases} x + 3y = -11 \\ 2y - z = -11 \\ 3x + 2z = 9 \end{cases}$ *(4 pts)*

IV. Word Problems *(4pts each)*

1. Twenty-five years ago, Janet was five more than one-third as old as Rhovic was. Today, Rhovic is twenty-six less than two times the age of Janet. How old is Rhovic?

2. The product of two consecutive number positive even integers is at most 48. Find the possible values of the two numbers.

END OF EXAM