MA 153 Exam 2 Spring 2001

Name: _____

Circle your answer to problems 1-3. You must show correct work to receive credit.

(8 pts.) 1) $i(2 - 3i)^2 =$

A. $12 - 5i$
B $13i$
C. 5
D. $12 + 13i$
E. $13 + 5i$
F. $5 + 12i$
G. None of the above

(8 pts.) 2) Find the distance between (2, 3) and (–6, 1).

A. $2\sqrt{5}$
B. $2\sqrt{17}$
C. $\sqrt{82}$
D. $4\sqrt{2}$
E. $\sqrt{6}$
F. $4\sqrt{5}$

(8 pts.) 3) Solve $B = \frac{1}{3}k(1 + r^2)$ for r. Assume $r > 0$.

A. $r = \sqrt{\frac{3B}{k} - 1}$
B. $r = \sqrt{\frac{B}{k} - 1}$
C. $r = \sqrt{3B - k - 1}$
D. $r = \sqrt{B - \frac{1}{3}k - 1}$
E. $r = \sqrt{\frac{B}{3k} + 1}$
F. $r = \sqrt{\frac{3B}{k} - 3}$

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(18 pts.) 4) Solve for x. Simplify completely.

(10 pts.) a) $3x^2 + 6x + 4 = 0$

(8 pts.) b) $\sqrt{x+18} = 2 - x$

(8 pts.) 5. Solve the inequality and express your answer in interval notation.

$|x - 2| \geq 4$

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(8 pts.) 6. Find a general form, $Ax + By = C$, (where A, B and C are integers), of the equation of the line through (-4, 3) and perpendicular to the line $2x - 5y = 15$.

(8 pts.) 7. Find the standard form of the equation of the circle with endpoints of a diameter at (-3, -5) and (-7, 9).

(12 pts.) 8. Solve the inequality and express the solution in interval notation. You must use a sign chart (or equivalent) to support your answer.

$$x^3 - 4x^2 + 4x > 0$$

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(10 pts.) 9. Bill's allowance in 1970 was \$49. In 2000, still living at home (how sad), his allowance was \$124. Assume his allowance is linearly related to time. Express his allowance, A (in dollars), in terms of time, t (in years), with $t = 0$ corresponding to the year 1970.

(12 pts.) 10. Starting with a piece of cardboard whose length is 3 inches longer than twice its width, an open box (no top) is to be constructed by removing 2-inch squares from the corners and folding up the sides. What does the original width of the cardboard have to be in order to produce a box with a volume of 30 cubic inches? Label the picture, set up an equation, and solve.