

EXAM 2 - MTH 127-501 SUMMER II 2010

Math 127-501
18 June, 2010

Name: _____

Read all of the following information before starting the exam:

- Show all work, clearly and in order, if you want to get full credit. I reserve the right to take off points if I cannot see how you arrived at your answer (even if your final answer is correct).
- Justify your answers algebraically whenever possible to ensure full credit. When you do use your calculator, sketch all relevant graphs and explain all relevant mathematics.
- Circle or otherwise indicate your final answers.
- Please keep your written answers brief; be clear and to the point.
- Good luck!

1. (15 points) Solve.
- (5 pts) $\frac{1}{5}x + 2 = 9$
 - (5 pts) $(x + 1)(x - 3) = (x + 3)(x + 5)$
 - (5 pts) $5 + \frac{1}{x-2} = 6$
2. (15 points) Compute.
- (5 pts) $(5 + 6i) + (3 - 2i) - (4 - 4i)$
 - (5 pts) $(1 + i)(2 - 3i) + (1 + i)$
 - (5 pts) $i^7 + i^5 - i^3 + i$
3. (15 points) What constant should be added to the following expressions to complete the square?
- (5 pts) $x^2 + 5$
 - (5 pts) $x^2 - \frac{1}{2}$
 - (5 pts) $x^2 + \frac{4}{5}$
4. (10 points) Solve.
- (5 pts) $|2x - 3| = 7$
 - (5 pts) $|3x + 1| \geq 10$
5. (15 points) Solve.
- (5 pts) $x^2 + 6x + 9 = 0$
 - (5 pts) $x^2 - 2x + 5 = 0$
 - (5 pts) $x^2 - 2x + 15 = 0$
6. (10 points) Solve.
- (5 pts) $-3 \leq \frac{5-3x}{2} \leq 6$
 - (5 pts) $\frac{2x-3}{5} + 2 \leq \frac{x}{2}$
7. (10 points) Trent can deliver his newspaper in 50 minutes. It takes Lois 30 minutes to do the same job. How long would it take if they worked together?
8. (10 points) Betsy wants her investment to have a return of 10%. She has 50,000 dollars, and has two options in which to invest: riskier 15% per year private investment bonds or 8% per year guaranteed government-backed bonds. How should she split her money between the two options to achieve her goal?

Bonus Question (5 Extra Credit Points): Derive the quadratic formula by completing the square on the equation $ax^2 + bx + c = 0$ and solving for x .