

EXAM 1 - MTH 127-501 SUMMER II 2010

Math 127-501
10 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. (25 points) Explain which numbers in the set $\{\pi, 0, \frac{1}{7}, 2, -10.333\dots \text{(3's repeat)}, 3\}$ are...
- (5 pts) natural numbers
 - (5 pts) integers
 - (5 pts) rational numbers
 - (5 pts) irrational numbers
 - (5 pts) real numbers

2. (10 points) Evaluate the following algebraic expressions when $x = 5$ and $y = -1$.
- (5 pts) $\frac{(xy)^2}{x} - y$
 - (5 pts) $x \cdot |y| + 5x$

3. (15 points) Simplify the following algebraic expressions.
- (5 pts) $(5x - 3) + (-7x^2 + 10) - (5 - x)$
 - (5 pts) $(x + 2)(x + 3)$
 - (5 pts) $(x + 1)^2 + (x - 1)^2$

4. (5 points) Write the following sentence in mathematical symbols: " x squared minus 15 is less than or equal to the product of 9 and y ".

5. (10 points) Simplify. $\frac{(x^2y)^{-4}}{(xy)^{-3}}$

6. (10 points) Find the hypotenuse of a right triangle which has legs of lengths 4 and 5.

7. (10 points) Graph the inequality $x < -5$.

8. (5 points) Marty's Muffin Company has a production cost $C = 20 + \frac{x}{2}$, in dollars, to produce x muffins. How much does it cost to produce 15 muffins?

9. (10 points) Compute the area of the given figure.

Bonus Question (2 Extra Credit Points): There are two solutions to the equation $x + x = x \cdot x$. Find them.

Bonus Question (2 Extra Credit Point): Explain why there is not a "closest" real number to 0.

Bonus Question (2 Extra Credit Points): What property of the real numbers says that if $a \cdot b = 0$, then $a = 0$, $b = 0$, or both?