

MATH 100

Final Exam

December 15, 2014

Name: _____

- No books, notes, or calculators are allowed.
- Please show all your work.
- Always explain your solutions and calculations.
- In each one of problems 1, 3, 4, 9 : 2 extra points will be given for a second solution.

1. (6 points) Write a story problem that can be solved using the following proportion. Explain clearly what quantities are related in the proportion. Solve your problem using this proportion.

$$\frac{15}{x} = \frac{32}{5}$$

2. (4 points) Explain why the units digit of a perfect square (i.e. the square of an integer) cannot be equal to 2.

3. (4 points) Mike asked Santa to bring him a book with 1234 pictures of animals. On Christmas, he found a book under his tree that said there were 20143_5 animal pictures in it. Does the book contain more or fewer pictures than Mike wanted?

4. (6 points) For this problem, clearly show all steps of problem solving.
A carpenter has three large boxes. Inside each large box are two medium-sized boxes. Inside each medium-sized box are five small boxes. How many boxes are there altogether?

5. (4 points) Put the following numbers in increasing order:

$$\pi, \quad \sqrt{\pi}, \quad \sqrt{3}, \quad \sqrt{7}, \quad \frac{62}{20}$$

6. (6 points) A rectangular prism with a square base has height 4 cm and volume 49 cm^3 . Find its surface area.

7. (6 points) For this problem, clearly show all steps of problem solving.
I am thinking of a number. One third of my number minus a half of that same number is equal to 9. What is my number?

8. (4 points) Find the greatest common factor of 2^{2014} and 2014^2 .

9. (6 points) Two right triangles are similar. One has hypotenuse 1 ft and area 0.2 ft^2 . The second triangle has hypotenuse 25 ft. What is the area of the second triangle?

10. (4 points) Which of the following numbers are rational numbers but not integers?

$$-\frac{4}{2}, \quad \sqrt{10}, \quad 3.14, \quad \frac{\sqrt{2}\sqrt{8}}{3}$$