

**MAT 331 Fall 2017, New Practice Quiz 1,  
Real Quiz 1 on Tuesday Sept 12, 2017 (30 minutes)**

Name	ID	Score
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**EVERY ANSWER IS A NUMBER AND YOU GET ONE POINT PER CORRECT DIGIT OR DECIMAL POINT. NOTES, TEXTBOOK AND USE OF MATLAB ARE ALLOWED, BUT NO ASSISTANCE FROM OTHER PEOPLE.**

For answers that are real numbers, include all non-zero digits to the left of the decimal place, include the decimal place in a box, and as many digits to the right of the decimal place as will fit in the remaining boxes. Truncate, do not round, e.g., given five boxes for  $\sqrt{7} = 2.64575131106\dots$ , write “2.645”. If a number has no digits to the left of the decimal point, start with the decimal point, e.g., given ten boxes, write  $1/\sqrt{2}$  as “.707106781”. Right justify integer answers, and place blanks (or zeros) in any remaining boxes on the left. For example, given 10 boxes to write  $2^{20}$  either write “0001048576” or “1048576” preceded by three blank boxes.

(1)

Find  $\sqrt{17}$ .

(2)

Sum  $1/\sqrt{n}$  from  $n = 1$  to  $n = 10,000$ .

(3)

Write  $2^{30}$  as an integer (usual decimal notation).

(4)

Let  $x_0 = 1/3$  and for  $n = 1, 2, 3, \dots$ , let  $x_{n+1} = 4x_n(1 - x_n)$  (e.g.,  $x_1 = .8888\dots$ ). What is  $x_{10}$ ? (Remember the up arrows.)

(5)

What is the sum of all the integers  $1 \leq n \leq 10,000,000$  that are perfect squares and end in the digit 1? (A perfect square is a integer that is the square of some integer. You may wish to use logical indexing the command `mod(a,b)` which gives the value of  $a$  modulo  $b$ , i.e., the remainder when  $a$  is divided by  $b$ .)

(6)

Find the first place in the decimal expansion of  $\pi$  that the sequence “999999” occurs. What are the ten digits that come just before these? Use the command `y=char(vpa(pi,n))` to create a string on the first  $n$  digits (including the 3 and the “.”). Then use `strfind`.