

MAT 331 Fall 2017, Practice Quiz 2

Quiz 2 on Tuesday, September 18, 2018 (30 minutes)

Name	ID	Score
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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”. If a number is negative, use the leftmost box for the negative sign. 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)

Use `fzero` to solve $\cos(x) = 2x + \sin(x)$.

(2)

Find the maximum value of $x^3 \exp(-x^2/4) \sin(20 * x)$ on the real numbers.

(3)

Use `roots` to find the rightmost (most positive) real root of $x^5 + 2x^4 - 10x^3 + 4x^2 + x + 1$.

(4)

Use `fzero` to find the rightmost (most positive) zero of $f(x) = x^2 - 4 + \sin(20x)$.

(5)

Which root does Newton’s method find in the previous problem if we start at $x = 3$?

(6)

How many zeros does $g(x) = \cos(20 \exp(2x) \sin(20 * x))$ have in the interval $[0, 1]$ (use the three boxes)? Which zero is closest to $1/2$ (use the seven boxes)?