

Math 10B with Professor Stankova

Quiz 14; Tuesday, 5/1/2018

Section #203; Time: 9:30 AM

GSI name: Roy Zhao

Name: _____

Circle True or False. (1 point for correct answer, 0 for incorrect answer)

1. **TRUE** False Changing the initial conditions for a linear homogeneous recurrence relation does not affect the bases of the exponential functions that appear in the direct formula for the relation.
2. True **FALSE** Checking that a function $y(t)$ is a solution to a DE may not be possible since we may not know how to solve the DE.
3. **TRUE** False There are IVP's in which the function $f(t, y)$ is continuous everywhere, but the solutions to the IVP cannot extend beyond a certain interval $[0, T)$.
4. **TRUE** False All I.V.P.'s for second order, linear, homogeneous ODE's with constant coefficients are solvable and have a unique solution.
5. True **FALSE** The DE $y' = 3y^2$ will have a slope field with same slopes lined up in vertical lines because the equation is autonomous.

Solution: They will have the same slopes lined up in horizontal lines because it does not depend on t .

6. True **FALSE** The dot product of vectors always yields a non-negative result, but it is the norm of a vector that gives its length.

Solution: The dot product may be negative.

7. True **FALSE** Two vectors (of same dimensions) are perpendicular if and only if their dot product is 0.

Solution: They are perpendicular if their dot product is 0.

8. **TRUE** False There are non-square matrices A and B for which it is possible to multiply them in either order but then AB cannot equal BA .
9. True **FALSE** As soon as we see a row like $(000 \dots 0|0)$ during Gaussian elimination, we know that the system will have infinitely many solutions.

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10. True **FALSE** If an eigenvector \vec{v} for a matrix A corresponds to eigenvalue $\lambda = 2018$, then $A^{2019}(\vec{v}) = 2019^{2018}$
11. True **FALSE** The least-square best-fitting line for any number of data points always exists and is unique essentially because there is a (unique) shortest distance from a point to a plane in any dimensions.
12. **TRUE** False If we use more data points to find the best-fitting line, we may increase the overall error S yet still be able to make better predictions about the data.