

Name: _____

Id: _____

You have 60 minutes to complete this exam. You may use a calculator. You may **NOT** use any books or notes. Please **SHOW YOUR WORK** and **EXPLAIN YOUR REASONING** wherever possible. This midterm has 5 questions, for a total of 180. Good luck!

1. Nine members of a theater department vote to decide which play they will perform next fall. Their preference rankings are as follows:

Play	Number of Voters		
	4	3	2
Romeo and Juliet	1	3	3
The Fantasticks	2	1	2
Death of a Salesman	3	2	1

- (a) (15 points) Which play will win if they hold a plurality election?

- (b) (15 points) Which play will win if they hold a runoff election? Show your work.

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(c) (15 points) Which play will win if they use Borda's Method? Show your work.

(d) (15 points) Which play (if any) is a Condorcet winner? Show your work.

(e) (10 points) Are all of the ballots single-peaked with respect to the order in which the plays are listed in the table above? (Answer YES or NO – No explanation is necessary.)

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2. A woman deposits \$600 into a savings account earning 5% interest compounded monthly.

(a) (20 points) What will be the total amount in the account in 5 years?

(b) (20 points) How long will it take for the account to reach \$2000?

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3. (20 points) If I deposit \$100 into an account that has an APY of 10%, how much money will be in my account after 3 years? (Either answer this question or, if you don't think that enough information has been given to answer this question, then explain why not.)
4. (30 points) If Joe takes out an amortized loan of \$20,000 at 6% interest compounded monthly to be paid back by equal payments at the end of each month for 20 years, how much will Joe have to pay each month? (Show your work.)

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5. (20 points) Circle the one that yields the largest account. (Justify your answer.)

(a) Making monthly deposits of \$100 at 16% interest for 12 years.

(b) Making monthly deposits of \$200 at 8% interest for 12 years.

(c) Making monthly deposits of \$100 at 8% interest for 24 years.