



EXAM 2 REVIEW OVER CHAPTERS 3 AND 4

- Setting Up Linear Programming Problems
- Graphing Systems of Linear Inequalities in Two Variables
- Graphical Solution of Linear Programming Problems
- Mathematical Experiments
- Basics of Probability
- Rules of Probability
- Probability Distributions and Expected Value

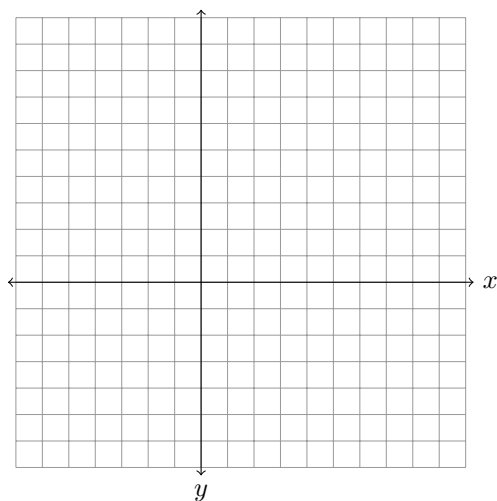
Pr 1. A local gordita truck has \$9000 available each month for advertising. Ads in the university newspaper will cost \$500 each, while radio ads costs \$30 each, and internet banners on the university library page cost 80 cents each. The taco truck wants to run at least twice as many radio ads as newspaper ads. Approximately 6000 students will see each newspaper ad, 4000 students will hear each radio ad, and 1200 students will see each internet banner. How many of each type of ad should the taco truck run to maximize the number of students who see or hear the ads? **Set up, but do not solve.**

Pr 2. Graph the system of inequalities below. Then determine if the solution set is bounded or unbounded and all corner points of the solution set.

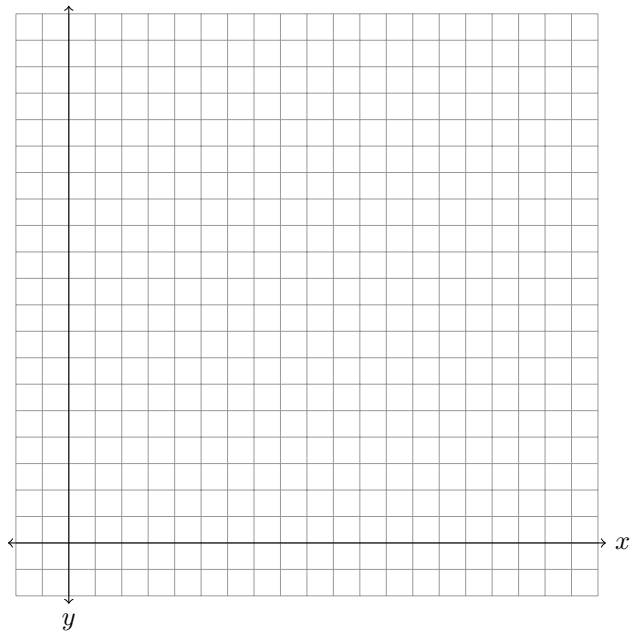
$$2x + y \geq 9$$

$$2x - 3y < 12$$

$$x \geq 0, y \geq 0$$



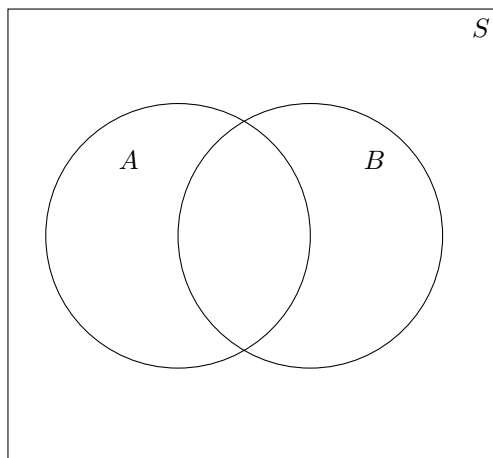
- Pr 3.** An investment company has two funds, A and B, that you can pick from for your personal investments. Each unit of fund A costs \$15, yields an annual return of 6%, and has a risk index of 1.5 per unit. Each unit of fund B costs \$12, yields an annual return of 5%, and has a risk index of 0.8 per unit. You have \$36,000 available for investing and want to earn at least \$1,800 in interest in the coming year. How many units of each fund should you purchase in order to meet your goals and also to minimize the total risk index for your portfolio?



Pr 4. A 4-H member raises only goats and pigs. She has pen space for no more than 18 animals. She spends \$30 to raise each goat and \$60 to raise each pig and she has \$900 available for this project. Each goat produces \$15 in profit and each pig \$30 in profit. Using linear programming techniques, we find 15 pigs and no goats should be raised to maximize the 4-H member's profit. Are there any leftover resources, and if so what are they?

Pr 5. In an experiment, a fair standard 12-sided die is rolled, noting whether or not the number facing is a multiple of 5, and then a card is drawn from a well-shuffled deck. Write the sample space for the experiment.

Pr 6. Shade $(A^C \cup B)^C \cup B$ on the Venn Diagram. Your answer must be obvious to the instructor.



Pr 7. Assuming two fair standard four-sided dice are rolled, one maroon and one white, and let

A = the event “a sum of 4 is rolled”,

B = the event “a 3 is showing on the maroon die”, and

D = the event “an number less than 3 shows on the white die”.

(a) Write the symbolic equivalent of the event “a sum of 4 is rolled, but the blue die isn’t showing a 3 and the green die is showing a number less than 3”.

(b) Verbally describe $D^C \cup A^C$

Pr 8. A survey of 50 veterans from the Air Force and Navy was taken to gather information on their service career and what life is like outside of the miliatry. A breakdown of those surveyed is shown in the table. Suppose a randomly selected veteran from the Air Force or Navy is interviewed. What is the probability the person chosen is

	Air Force	Navy	Total
Private	5	8	13
Corporal	11	8	19
Sergeant	5	4	9
Lieutenant	2	2	4
Captain	2	3	5
Total	25	25	50

(a) P(is a Corporal or in the Navy)

(b) P(in the Air Force or in the Navy)

(c) P(is a Private and a Lieutenant)

(d) P(is not in the Air Force, but is a Sergeant)

(e) P(is not a Captain and is in the service)

Pr 9. Given $P(A) = 0.4$, $P(B) = 0.7$, and $P(A \cup B) = 0.9$, compute $P[(A \cap B)^C]$.

Pr 10. Your insurance company has a policy to insure personal property. Assume your personal property is worth \$2,500, and according to campus statistics there is a 2% chance that your property will be stolen during the next year and a 12% chance that your property is damaged beyond repair through natural causes during the next year. If your property is stolen the policy will give you \$2,500, while if it is damaged beyond repair you receive get \$1,200. What is the insurance company's expected profit on this policy, if the premium for the policy is \$300?