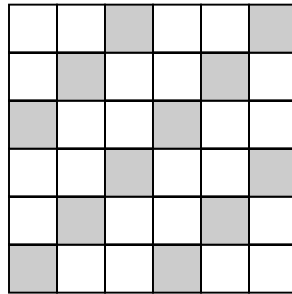


[15] 1. Write a PostScript program to draw the following figure:



[15] 2. (a) Write down a parametrization for the ellipse

$$4x^2 + 9y^2 = 1 .$$

Be careful!

(b) On the next page, write down a complete PostScript program which uses this parametrization and `mkspath` to draw this curve. Make your program a bit flexible.

- [20] 3. (a) Draw the line $2x + y = 1$ below. Show the reflection of the origin through this line. Show the reflection of $(2, 1)$ through this line.
- (b) Write down a formula for the reflection of (x, y) through this line.
- (c) Write down a formula for the reflection of (x, y) in the line $Ax + By = 0$.

**The University of British Columbia
Midterm Examination
November 8, 1996
Mathematics 308
Section 101
Instructor: Dr. Casselman**

Duration: 50 minutes

- (1) Be sure that you have 4 pages in addition to this one.
- (2) Put your name below and on the **back** of the other pages, where you should write it as **<last name>**, **<first name>**.
- (3) In all questions, **you must show work** — i.e. display intermediate results — to get full credit.
- (4) You may use a calculator.
- (5) Be neat! I will not attempt to decipher messy calculations.
- (6) *All work you wish to be graded must be placed on these sheets. Work books should be used for scrap work only, and must not be handed in. I will simply throw away any other papers I receive.*

First Name _____ **Last Name** _____

Signature _____ **Student Number** _____

Rules governing examinations

- Each candidate should be prepared to produce upon request his library/AMS card.
 - No candidate shall be permitted to enter the examination room after the expiration of one half hour, or to leave during the first half hour of the examination.
 - Candidates are not permitted to ask questions of the invigilators, except in cases of supposed errors or ambiguities in examination questions.
 - **CAUTION** - Candidates guilty of any of the following or similar practices shall be immediately dismissed from the examination and shall be liable to disciplinary action.
 - (a) Making use of any books, papers, or memoranda, other than those authorized by the examiners.
 - (b) Speaking or communicating with other candidates.
 - (c) Purposely exposing written papers to the view of other candidates.
 - Smoking is not permitted during examinations.
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1.	2.	3.	Total
15	15	20	50