Math 115 — Finite Mathematics

Prediction 1

Time: 90 minutes Total: 100 marks No calculators

Name: _____ Student ID: _____

Sections 1.1–1.2, 4.1–4.3, 5.1–5.3. Answer all questions and show all your work. Calculators and mobile phones are not allowed.

Predicted paper: the most frequently examined question types, all taken from the 2023–2024 examinations.

Written Questions — 100 marks

Question 1 **[15 marks]**

Solve the following inequalities and write the solution in interval form:

$$\frac{1}{2}+3x<\frac{1}{3}-2x\le\frac{1}{3}x+5.$$

Question 2 **[10 marks]**

Solve the following system using elimination by addition:

$$3x-2y=4$$
$$2x+3y=7$$

Question 3 **[15 marks]**

(a) Find an equation of the line that passes through $(0,2)$ and $(1,0)$.

(b) Find an equation of the line that has slope 2 and passes through $(-6,0)$.

(c) Find the intersection of the two lines given in parts (a) and (b).

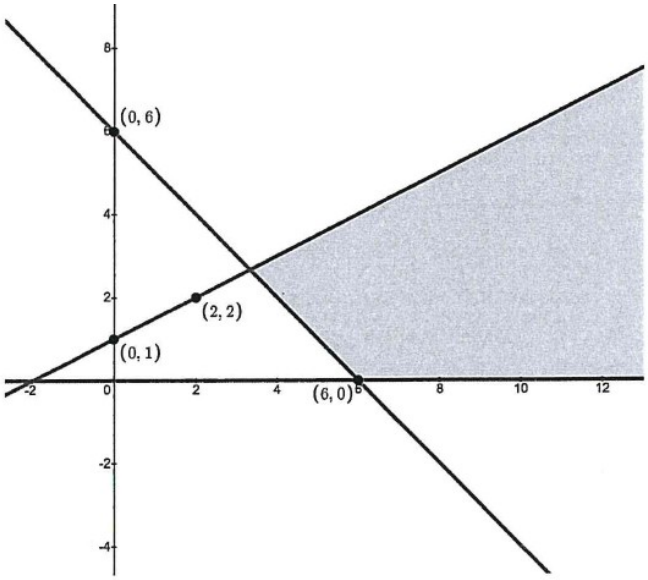
Question 4 **[20 marks]**

Solve the following system using Gauss-Jordan elimination:

$$3x_1+8x_2-x_3=-18$$
$$2x_1+x_2+5x_3=8$$
$$2x_1+4x_2+2x_3=-4$$

Question 5 **[10 marks]**

Write the linear inequalities defining the shaded region:



Question 6 **[15 marks]**

Maximize and minimize $P = 4x + y$

subject to

$$3x + 2y \geq 18$$
$$x \leq 9$$
$$y \leq 6$$
$$x \geq 0, y \geq 0$$

Question 7 **[15 marks]**

A chemical manufacturer wants to lease a fleet of 10 railroad tank cars with a combined carrying capacity of 45000 gallons. Tank cars with three different carrying capacities are available: 3000 gallons, 4000 gallons, and 5000 gallons. How many of each type of tank car should be leased?

End of paper

تم إعداد هذا النموذج من منصة مُرشـد،
للاشتراك في مادة Finite 115 تواصل معانا على رقم المنصة: 41110098