

Math 110 – Chapter 5 – Worksheet 2 – Version A

Systems of Nonlinear Equations; Systems of Nonlinear Inequalities

Section 5.4 Systems of Nonlinear Equations

1. Solve the system of equations by the substitution method.

$$\begin{cases} x^2 + y = 2 \\ 2x + y = 3 \end{cases}$$

2. Solve the system by the substitution method.

$$\begin{cases} x^2 + 2y^2 = 34 \\ x^2 - y^2 = 7 \end{cases}$$

3. Jamie bought 240 stocks of Alpha Airlines at \$40 per share and paid \$100 in broker's fees. She kept these shares for 3 years, during which time she received a number of additional shares of stocks as dividends. At the end of three years, her dividends were worth \$1950 and she sold her stock and made a profit of \$7850 (after paying \$100 in initial broker's commission). How many shares of the stock did she receive as dividends? What was the selling price of each share of stock?

Section 5.5 Systems of Nonlinear Inequalities

4. Graph the linear inequality $3x + y < 6$
5. Graph the linear inequality $y \geq -2x + 4$
6. Graph the system of linear inequalities: $\begin{cases} 3x - y > 3 \\ x - y \geq 1 \end{cases}$
7. Graph the system of linear inequalities: $\begin{cases} 2x + 3y < 16 \\ 4x + 2y \geq 16 \\ 2x - y \leq 8 \end{cases}$
8. Graph the nonlinear inequality: $y > -(x + 1)^2 + 4$
9. Graph the system of nonlinear inequalities: $\begin{cases} y \geq x^2 + 1 \\ y \leq -x + 13 \\ y < 4x + 13 \end{cases}$