Math5900 Homework #9

Make sure your work is neatly presented. Show all your work, with thorough explanations.

Systems of Linear Equations & Quadratic Equations

1. Solve these systems of equations with either the substitution or elimination method.

(a) $\begin{aligned} 3x-2y&=7 \\ 2x+4y&=6 \end{aligned}$

(b) $\begin{aligned} 5x+3y&=9 \\ 2x-4y&=14 \end{aligned}$

(c) $\begin{aligned} x-3y&=5 \\ -2x+6y&=-10 \end{aligned}$

(d) $\begin{aligned} \frac{1}{2}x-\frac{1}{3}y&=1 \\ \frac{1}{4}x-\frac{1}{9}y&=\frac{2}{3} \end{aligned}$

(e) $\begin{aligned} 12x-5y&=2 \\ -24x+10y&=6 \end{aligned}$

(f) $\begin{aligned} 0.7a-b&=-0.4 \\ 0.3a-0.8b&=0.2 \end{aligned}$

2. The length of a rectangle is 3 inches more than its width. The area of the rectangle is 70 square inches. Find the length and width of the rectangle.

3. A grocer wants to mix cashews worth \$8 per pound with peanuts worth \$3 per pound. She wants to obtain a mixture to sell for \$4 per pound. How many pounds of peanuts must be used with 5 pounds of cashews?

4. Solve these quadratic equations.

(a) $8x^2-9=21x$

(b) $2x^2-6x+3=0$

(c) $(x+4)^2-100=0$

(d) $x(x-3)-10(x-3)=0$

(e) $2y(y-2)=7$

(f) $2x^2+3x-20=0$

5. A corner lot has an L-shaped sidewalk along its sides. The total length of the sidewalk is 51 feet. By cutting diagonally across the lot, the walking distance is shortened to 39 feet. What are the lengths of the two legs of the sidewalk?

6. A Little League baseball team obtains a block of tickets to a ball game for $96. After three more people decide to go to the game, the price per ticket is decreased by $1.60. How many people are going to the game?

7. Twenty-one years ago Jack was twice as old as Jill. Fourteen years ago, Jack was only one and a half times as old as Jill. How old are Jack and Jill today?

8. (a) Write 465 as a "quadratic" expression.

(b) Write 322_4 as a "quadratic" expression.