

Instructions: Show work on a separate sheet of paper and attach to this page. You may check your work with technology not available in class, but you should be able to solve problems and show work without such technology.

1. Solve each system i) graphically, ii) with substitution, iii) with elimination by addition. Verify that all three methods produce the same result. Characterize each solution as consistent or inconsistent, and if applicable, dependent or independent.

a.
$$\begin{cases} x + 3y = 8 \\ y = 2x - 9 \end{cases}$$

c.
$$\begin{cases} y = 3x - 5 \\ 21x - 35 = 7y \end{cases}$$

b.
$$\begin{cases} 2x + 5y = -4 \\ x - 3y = 0 \end{cases}$$

d.
$$\begin{cases} \frac{x}{6} - \frac{y}{2} = \frac{1}{3} \\ \frac{x}{4} - \frac{y}{4} = -1 \end{cases}$$

2. Solve the system
$$\begin{cases} \frac{x-y}{3} = \frac{x+y}{2} - \frac{1}{2} \\ \frac{x+2}{2} - 4 = \frac{y+4}{3} \end{cases}$$
 using the method of your choice.

3. A hotel has 200 rooms. Those with kitchen facilities rent for \$100 per night, and those without kitchen facilities rent for \$80 per night. On a night when the hotel was completely occupied, revenues were \$17,000. How many of each type of room does the hotel have?

4. Use the information in the graph below to find the angles.

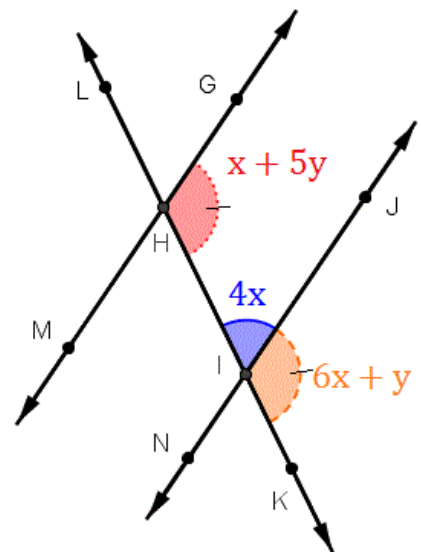
5. Solve each system by the method of your choice. Characterize each solution as consistent or inconsistent, and if applicable, dependent or independent.

a.
$$\begin{cases} 2x + y - 2z = -1 \\ 3x - 3y - z = 5 \\ x - 2y + 3z = 6 \end{cases}$$

b.
$$\begin{cases} x + 2y - z = 1 \\ 2x - y + z = 3 \end{cases}$$

c.
$$\begin{cases} 3(2x + y) + 5z = -1 \\ 2(x - 3y + 4z) = -9 \\ 4(1 + x) + 3 = -3(z - 3y) \end{cases}$$

d.
$$\begin{cases} \frac{x+3}{2} - \frac{y-1}{2} + \frac{z+2}{4} = \frac{3}{2} \\ \frac{x-5}{2} + \frac{y+1}{3} - \frac{z}{4} = -\frac{25}{6} \\ \frac{x-3}{4} - \frac{y+1}{2} + \frac{z-3}{2} = -\frac{5}{2} \end{cases}$$



6. Find the quadratic equation that passes through the points $(-1,6)$, $(1,4)$, $(2,9)$.

7. A person invested \$17,000 for one year, part at 10%, part at 12% and the remainder at 15%. The total annual income from these investments was \$2110. The amount of money invested at 12% was \$1000 less than the amount invested at 10% and 15% combined. Find the amount invested at each rate.