

Homework 2: Due Jan 25th (Friday)

- (1) Find all solutions to the following system of equations:

(a)

$$2x + 3y + 4z = 1$$

$$4x - 9y + 16z = 1$$

$$3x + 3y - z = 2$$

(b)

$$x + y = 1$$

$$2x + 3y = 0$$

$$4x + 9y = -1$$

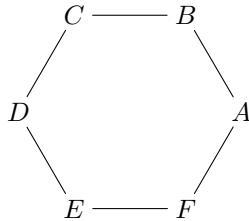
(c)

$$a + b + c = 2$$

$$2a - 2b + c = 5$$

$$3a - b + 2c = 7$$

- (2) Find three equations and three unknowns such that  $(x, y, z) = (2, 4, 1)$  as the only solutions.
- (3) Find two equations and two unknowns such that  $(x, y) = (0, 2) + t(1, 1)$  are all the solutions to this system.
- (4) Let  $\overline{OA} = [3, 4]$  and  $\overline{OB} = [2, 2]$ . Evaluate  $\overline{AB}$ .
- (5) In the following figure,  $A, B, C, D, E,$  and  $F$  are the vertices of a regular hexagon centred at the origin. Express each of the following vectors in terms of  $\mathbf{a} = \overline{OA}$  and  $\mathbf{b} = \overline{OB}$



(Note: a better picture can be found in Poole's book, figure 1.24) Calculate the following vectors in terms of  $\mathbf{a}$  and  $\mathbf{b}$ .

(a)  $\overline{AB}$

(b)  $\overline{AD}$

(c)  $\overline{BC}$

(d)  $\overline{CF}$

(e)  $\overline{AC}$

(f)  $\overline{BC} + \overline{DE} + \overline{FA}$