MATH 1210 A01 Summer 2013 Problem Workshop 10

1. Evaluate the following determinants. Simplify the second answer as much as possible.

   (a) $\begin{vmatrix} 2 & 1 & -3 & 0 \\ 4 & 2 & 1 & 5 \\ -3 & 3 & -2 & 2 \\ 4 & 5 & 2 & -4 \end{vmatrix}$

   (b) $\begin{vmatrix} x & x^2 & x^3 \\ y & y^2 & y^3 \\ z & z^2 & z^3 \end{vmatrix}$

2. Evaluate the following determinants. Simplify the second answer as much as possible.

   (a) $\begin{vmatrix} 4 & 6 & 2 & 2 \\ 2 & 4 & 6 & 8 \\ -3 & -2 & -1 & 1 \\ 2 & 5 & 7 & 2 \end{vmatrix}$

   (b) $\begin{vmatrix} a+b & a & a & a & a \\ a & a+b & a & a & a \\ a & a & a+b & a & a \\ a & a & a & a+b & a \\ a & a & a & a & a+b \end{vmatrix}$

3. Use Cramer's Rule, if possible, to find the value of z satisfying the equations

$$x + 2y - 3z + 6w = 0$$
$$2x - y + w = 0$$
$$5y + z - 2w = 0$$
$$x + y + z + w = 0$$

4. Use Cramer's Rule, if possible, to find the value of z satisfying the equations

$$x + y - 3z = 5$$
$$2x + 2y - w = 0$$
$$3x - 2y + z = 1$$
$$3y + 2z - w = 0$$

<u>Answers</u>

1. (a) 891 (b) $xyz(y - x)(z - x)(z - y)$

2. (a) 384 (b) $5ab^4 + b^5$

3. $z = 0$.

4. $z = 1$.