Math Document Template

C ANISH

***Abstract*—This is a document explaining a question about the concept of finding the determinant of a matrice.**

Download all python codes from

```
svn co https://github.com/chakki1234/summer
    −2020/trunk/linearalg/codes
```

and latex-tikz codes from

```
svn co https://github.com/chakki1234/summer
    −2020/trunk/linearalg/figs
```

1 Problem

Find the determinant of

(i) $\begin{vmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{vmatrix}$ (ii) $\begin{vmatrix} x^2 - x + 1 & x - 1 \\ x + 1 & x + 1 \end{vmatrix}$

2 Solution

Solution: Determinant of a $2x2$ matrice is obtained as follows

$$A = \begin{vmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{vmatrix}$$

$$detA = a_{11}a_{22} - a_{12}a_{21} \tag{2.0.1}$$

From 2.0.1:

$$(i)\ det = \cos\theta^2 + \sin\theta^2 = 1 \tag{2.0.2}$$

$$(ii)\ det = x^3 - x^2 + 2 \tag{2.0.3}$$