

# Document Title

Document Subtitle

by

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- Item test list
- Bullet test

\* \* \*

## 1. First Numbered Section

### 1.1. Another Section

$$f = \frac{1}{10} \sin(\theta) = \pi$$

$$f(x) = 5x + 3$$

$$e^{(i)\theta} = 1 + e^{(i)\theta} + \frac{1}{2!} (i\theta)^2 \dots$$
$$+ \frac{1}{N-1} (i\theta)^{N-1} + \frac{1}{N} (i\theta)^N$$

$$K_e = \int_{T_e} K \begin{bmatrix} (c_1^k)^2 & x_k & y_k \\ (c_1^l)^2 & x_l & y_l \\ (c_1^m)^2 & x_m & y_m \end{bmatrix} d\Omega$$

```
np.set_printoptions(suppress=True)
# Coordinates are in [x,y,z] format
# Represent x and y coordinates in vandermonde form without z coordinates12349
# [1 xk yk]
# [1 xl yl]
# [1 xm ym]
# The find values of c using [coordinate matrix]*[c] = [f]
# => [c] = [coorindate matrix]^-1 * [f]
```

```
def getConstants(xyz,N):  
    coordinateMatrix = np.zeros((N,N))  
    f = np.eye(N)  
    for i in range (0,N):  
        coordinateMatrix[i][0] = 1  
        coordinateMatrix[i][1] = xyz[i][0]  
        coordinateMatrix[i][2] = xyz[i][1]  
  
    c = np.zeros((N,N))  
    # Find all c values, solution stored row-wise  
    inverseMat = np.linalg.inv(coordinateMatrix)  
    for i in range (0,N):  
        c[i] = np.matmul(inverseMat,f[i])  
  
    # Transpose c so the solutions for equations are along columns (not rows)  
    c = np.transpose(c)  
    return c
```

