4. EQUATION SOLVING

d) Solving systems using row echelon form

November 27, 2021

1 Question

Obtain the row reduced echelon form from the following system of equations

$2x + 8y + 4z = 2$

$2x + 5y + z = 5$

$4x + 10y - z = 1$

Mention the values of x , y and z obtained.

2 Solution

[96]:
```
from sympy import Matrix, pprint
A = Matrix([[2, 8, 4], [2, 5, 1], [4, 10, -1]])
B = Matrix([[2], [5], [1]])
A_B = A.col_insert(1, B)
```

[84]:
```
A
```

[84]:
$$\begin{bmatrix} 2 & 8 & 4 \\ 2 & 5 & 1 \\ 4 & 10 & -1 \end{bmatrix}$$

[85]:
```
B
```

[85]:
$$\begin{bmatrix} 2 \\ 5 \\ 1 \end{bmatrix}$$

[98]:
```
print("Row echelon form of A:B is")
pprint(A_B.rref()[0])
```

```
Row echelon form of A:B is
1  0  0  -11/3

0  1  0   1/3

0  0  1   4/3
```

x is -11/3, y is 1/3 and z is 4/3.