

Linear systems of equations

Linear
systems of
equations,
matrix
inverse

Given the system of equations:

$$\begin{cases} 6x + 12y + 4z = 70 \\ 7x - 2y + 3z = 5 \\ 2x + 8y - 9z = 64 \end{cases}$$

Solve it!

```
>> A=[6 12 4;7 -2 3;2 8 -9]
>> b=[70;5;64];
>> x=A\b; x'
ans =
     3     5    -2
```

Linear systems of equations, continued

```
>> [A*x b] % Check by multiplication:
ans =
    70    70
     5     5
    64    64

>> b=[70;5;64];
>> x=A\b; x'
ans =
     3     5    -2

>> x=inv(A)*b % Alternatively multiply by inverse
```

- Backslash `\` is recommended for efficiency and accuracy.
- Linear systems don't always have a unique solution.
- `det(A)==0` is not a numerically reliable way of testing "almost singularity". See `help cond, rcond`.