Problem Sheet 1

Deadline: **Monday 12 October, 5:00**.
Hand in to **drop box 5** in the undergraduate common room (maths department, room 502).

Hand in the questions marked with an asterisk (*).

One mark will be deducted if you do not **staple your work**.

1) Solve the following equations:

   a) $4x + 16 = 0$

* b) $x^2 + 5x - 24 = 0$

   c) $x^2 - 5x - 24 = 0$

   d) $x^2 + 5x = -6$

   e) $x^2 + 5x = 0$

* f) $3x^2 + 8x + 1 = 0$

2) Solve the following equations:

* a) $x^3 + 4x^2 + x - 6 = 0$ (Clue: $x = 1$ is one solution)

   b) $x^3 - 5x^2 + 60x - 224 = 0$ (Clue: $x = 4$ is one solution)

   c) $x^3 - 2x^2 - 4x = 0$

3) Which of the following are functions?
If they are functions, find their range.
If not, explain why not.

   a) $a(x) = x + 2$ with domain $\mathbb{R}$

   b) $b(x) = \sqrt{x}$ with domain $\mathbb{N}$.

* c) $c(x) = x^2 + 3$ with domain $\mathbb{R}$.

* d) $d(x) = \sqrt{x}$ with domain $\mathbb{R}$.