$$x_{n+1} - \frac{x_n}{1+n} = 0 \quad , \quad x_0 = 1$$

$$x_{n+1} - r x_n = 0$$
$$r \in \mathbb{R}$$
$$x_n = C r^n$$

$$x_{n+1} = \frac{x_n}{1+n}$$

$$x_0 = 1$$

$$x_1 = \frac{x_0}{1+0} = 1 \quad , \quad x_2 = \frac{x_1}{1+1} = \frac{1}{2}$$

$$x_3 = \frac{x_2}{1+2} = \frac{1/2}{3} = \frac{1}{6}$$

$$x_4 = \frac{x_3}{1+3} = \frac{1/6}{4} = \frac{1}{24} \quad \ldots \qquad x_n = \frac{1}{n!}$$

$$6x_{n+2} + 5x_{n+1} - 4x_n = 0, \quad x_0 = 1, \quad x_1 = 1/2$$

$$x_{n+2} = \frac{4x_n - 5x_{n+1}}{6},$$

$$x_2 = \frac{4x_0 - 5x_1}{6} = \frac{4 - 5/2}{6} = \frac{3/2}{6}$$

$$x_3 =$$

$$x_{n+1} - 3x_n = a \quad , \qquad n \geq 0 \quad , x_0 = 1$$

Begrenset for alle verdier av n.

Homogen løsning $x_n^h = C \cdot 3^n$ $\quad (x_{n+1} = 3x_n)$

Partikulær løsning. $x_n^p = A$

$$a = x_{n+1}^p - 3x_n^p = A - 3A = -2A, \quad A = -a/2$$

$$x_n = x_n^h + x_n^p = C \cdot 3^n - a/2$$

$$1 = x_0 = C - a/2 \quad , \quad C = 1 + \frac{a}{2}$$

Endelig løsning: $x_n = (1 + \frac{a}{2}) 3^n - \frac{a}{2}$

Dette vil ikke vokse om $1 + \frac{a}{2} = 0$, $a = -2$.

Lineære differensligninger:

Generell slik ligning:

$$x_{n+2} + f(n)\, x_{n+1} + g(n)\, x_n = h(n)$$

$$f(n) = e^{\cos n + 1/n}$$