

## Discrete time systems and z-transform

### Exercises lektion 10

1. Calculate the inverse z-transform of the following sequences:

a)  $X(z) = (1 + 3z)(1 + 2z^{-1})(1 - z^{-1})$

b)  $X(z) = \frac{1 - \frac{1}{2}z^{-1}}{1 + \frac{3}{4}z^{-1} + \frac{1}{8}z^{-2}} \quad |z| > \frac{1}{2}$

c)  $X(z) = \frac{1 - \frac{1}{2}z^{-1}}{1 - \frac{1}{4}z^{-2}} \quad |z| > \frac{1}{2}$

d)  $X(z) = \frac{1 - az^{-1}}{z^{-1} - a} \quad |z| > \left| \frac{1}{a} \right|$

e)  $X(z) = \ln(1 - 4z) \quad |z| < \frac{1}{4}$

f)  $X(z) = \frac{3 - 7z^{-1} + 5z^{-2}}{1 - \frac{5}{2}z^{-1} + z^{-2}} \quad \frac{1}{2} < |z| < 2$