

# ECE 343 - Homework #23

Solving Difference Equations with z-Transforms - Summer 2018

## Loan Calculations

1) Assume you take out a loan to buy a car. The terms of the loan are

- Loan amount = \$10,000
- Interest rate = 6% / year (0.5% per month)
- Monthly payments for 5 years (60 payments)
- The first payment is in one month.

What is your monthly payment?

How much will you end up paying for that car?

2) Assume you have \$10,000 on your credit card with an interest rate of 18% / year.

- Loan amount = \$10,000
- Interest rate = 18% / year (1.5% per month)
- Monthly payments for 10 years (120 payments)
- The first payment is in one month.

What is your monthly payment?

How much will you end up paying for that car?

## Solving Difference Equations

Find  $y(k)$

$$3) \quad Y(z) = \left( \frac{0.2}{z-0.9} \right) X$$

$$x(k) = u(k)$$

$$4) \quad Y(z) = \left( \frac{0.2z}{(z-0.9)(z-0.8)} \right) X$$

$$x(k) = u(k)$$

$$5) \quad Y(z) = \left( \frac{0.2z}{z^2-1.7190z+0.81} \right) X$$

$$x(k) = u(k)$$

$$6) \quad Y(z) = \left( \frac{0.2z}{(z-0.9)(z-0.8)} \right) X$$

$$x(k) = \sin(0.1k)u(k)$$