

## Homework 2

### Problem 1

Derive equalities:

(a)

$$\tan^2 x + 1 = \frac{1}{\cos^2 x}$$

(b)

$$\cot^2 x + 1 = \frac{1}{\sin^2 x}$$

### Problem 2

Simplify as much as possible:

(a)

$$\sin(\arccos(2x)) =$$

(b)

$$\cos(\arctan(x/2)) =$$

(c)

$$\tan(\arcsin(\theta)) =$$

### Problem 3

Expand in partial fractions (check your answer by adding them back):

$$\frac{x^3 + 4x^2 - 5x + 4}{(x - 1)^2(x^2 + 1)} =$$