**Homework 2**

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**Exercise 1**

Claim .

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**Exercise 2**

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Let .

Then

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Thus, , so that , where .

Therefore,

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, .

And if , then

. QED

**Exercise 3**

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**Exercise 4**

1. .

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Thus, .

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Thus, ,

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1. .

No. Given , we cannot make efficient portfolio.

**Exercise 5**

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Actually, I can’t understand what is the exact meaning of ‘perfect correlation’, i.e.

But because they have linear relationship, so that having correlation in terms of those.