Extra exercises Math3 week3, part 2

Linear algebra: topics: dot product, cross product

20120622

EXERCISE 2 *(5+5 points)*

In the 2-dimensional plane, there is a line *l* given by the vector form:

−1

6

2

3

x

y

= + λ

a. Find the equation of the line *n* through the point (1,1) parallel to *l*.

b. Find the equation of the line *m* through the point (1,1) perpendicular to *l*.

EXERCISE 3 *(7 + 7 points)*

V is the plane given by the linear equation 3x+5y-2z=10

a. Give a vector form of this plane V.

b. Calculate all the intersection-points of this plane V with the line

#### x 1 3

y = 2 + λ 1

z 0 1

EXERCISE 4 *(4+4 points)*

1 *x*

Given the vector **r** = −2 and  **s** = 1 with *x* unknown.

1 4

a. Calculate the value of *x* if you know that vector **s** is perpendicular to **r**?

b. Calculate the value of *x* if you know the length of vector **s** is 5?

Languages: topics: Finite State Machines (FSM), conversion of graph to FSA

20130117

EXERCISE 8 *(5+5+5 points)*

Given is the state table of the finite state machine M. s0 is the initial state.

|  |  |  |
| --- | --- | --- |
|  | x | y |
| s0 | s2, a | s0, a |
| s1 | s0, a | s2, b |
| s2 | s2, b | s1, a |

1. Draw a state diagram for this M
2. Give the output string if the input string is *xxyxy*
3. Give a possible input string for the output string *abbaa*