u = [-4,1,2]; v = [0,9,-6], w = [3,-2,-1]; x = [1,5], y = [0,8]

5.1

1. u+v: [-4,10,-4]
2. u-w: [-7,3,3]
3. 2v: [0,18,-12]
4. 3u-2v+w: [-12,3,6]-[0,18,-12]+[3,-2,-1] = [-12,-15,-6]+[3,-2,-1] = [-9,-17,-7]
5. x+y-y: [1,5]-[0,-8]+[0,-8] = [1,5]
6. 2x+u: Is niet mogelijk omdat de vectoren andere groottes hebben

5.2

1. <u|v>: -4\*0+1\*9+2\*-6 = 0+9+-12 = **-3**
2. <v|u>: 0\*-4+9\*1+-6\*2 = 0+9+-12 = **-3**
3. <w|x>: **niet gelijke vectoren**
4. <u|v>w: -4\*0+1\*9+2\*-6 = 0+9+-12 = -3; 3\*-3+-2\*-3+-1\*-3 = -9+6+-3 = **-6**
5. <<u|v>w|w>:   
   -4\*0+1\*9+2\*-6 = 0+9+-12 = -3  
   3\*3+-2\*-2+-1\*-1 = 9+4+1 = 13

-3 \* 13 = **-39**

1. <<x|y>w|w>:

1\*0+5\*8 = 0+40 = 40

3\*3+-2\*-2+-1\*-1 = 9+4+1 = 13

13 \* 40 = **520**

1. <<x|y>x|w>:

**niet gelijke vectoren**

5.3

A = [0,-1] B= [-3, 0] u = [3] v= [8]  
 [1, 0] [0, 2] [5] [2]

1. Au

A2\*2 \* u2\*1 = N2\*1

1. B(Au)

B2\*2 ( A2\*2 \* u2\*1 ) = B2\*2 \* N2\*1= M2\*1

1. (BA)u

(B2\*2 \* A2\*2)u2\*1 = N2\*2 \* u2\*1 = M2\*1

1. uTv

uT 2\*1 \* v1\*2 = N2\*2

1. vTu  
   vT 2\*1 \* u1\*2 = N2\*2
2. (Av+Bu)vT  
   Av = A2\*2 \* v2\*1= N2\*2  Bu = B2\*2 \* u2\*1 = M2\*2

N2\*2 + M2\*2 = O2\*2

(O)yt = O2\*2 \* vT1\*2 = P2\*2

5.4

5.5

3 hidden layers

576 input neurons

64 neurons in hidden layer 1

16 neurons in hidden layer 2

16 neurons in hidden layer 3

4 output neuron

Met bais:

Θβ1 ∈ R64\*567+1

Θβ2 ∈ R16\*64+1

Θβ3 ∈ R16\*16+1

Θβ4 ∈ R4\*16+1

y = σ(Θβ4[1, σ(Θβ3[1, σ(Θβ2[ 1, σ(Θβ1[1, x])])])])

Met bais vector:

Θβ1 ∈ R64\*567

Θβ2 ∈ R16\*64

Θβ3 ∈ R16\*16

Θβ4 ∈ R4\*16

bβ1 ∈ R64

bβ2 ∈ R16

bβ3 ∈ R16

bβ4 ∈ R4

y = σ(Θβ4σ(Θβ3σ(Θβ2σ(Θβ1x+ bβ1)+ bβ2)+ bβ3) +bβ4)

5.6

5.7

