1. Problem Set 1, u = [0.5;0.5] and v = [3; -4]
2. Dot product

= [0.5, 0.5] [3, -4]

= 0.5\*3 + 0.5\*(-4)

= 1.5 – 2

= -0.5

1. Length of vectors

|u| =

=

=

= 0.7071

|v| =

=

=

= 5

1. What is the linear combination: 3u − 2v

= 3 - 2

= [3\*0.5, 3\*0.5] – [2\*3, 2\*(-4)]

= [1.5, 1.5] – [6, -8]

= [1.5 – 6, 1.5 + 8]

= [-4.5, 9.5]

1. What is the angle between u and v

=

=

=

= -0.1414

= (180acos (-0.1414)

= 98.1301

1. Problem Set 2

Gaussian Elimination

1. Equations with 3 variables with 3 constraints

1. Rewrite in matrix A and constraint vector b
2. R2 – 2 R1 -> (multiply 1 row by 2 and subtract it from 2 row); R3 + 1 R1 -> R3 (multiply 1 row by 1 and add it to 3 row)
3. R2 /-3 -> R2 (divide the row 2 by -3)
4. R1 – 1 R2 -> R1 (multiply 2 row by 1 and subtract it from 1 row); R3 + 1R2 -> R3 (multiply by 2 row by 1 and add it to 3 row)
5. R3 / -> R3 (divide 3 row by )
6. R1 – R3 -> R1 (multiply 3 row by and subtract it from 1 row); R2 – R3 -> R2 (multiply 3 row by and subtract it from 2 row)

**Answer:**