**LAFDS Session 2 Homework**

**Full Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Group No.: \_\_\_\_**

**Lecturer Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Submission date: \_/\_/\_\_ Grade: \_\_/20**

## Please write down all the steps not the final answer only

## Questions (20 points):

1. (3 point) Express the vector (9; 6) as a linear combination of the vectors (1; 2) and (1;-4).
2. (3 point) Determine whether the vector x1 = (2; 1; 3) lies in the span of the vectors x2 = (1; 2; 3) and x3 = (2; 3; 1).
3. (6 points) Express the vector “w” as a linear combination of the given vectors vi

* v1 = , w =
* v1 = , v2 = , w =

1. (6 points) Match each set of vectors with their corresponding span

|  |  |
| --- | --- |
| 1. v1 = 2. v1 = , v2 = 3. v1 = 4. v1 = , v2 = 5. v1 = , v2 = 6. v1 = , v2 = | a) The span is the line y = 1/2 x  b) The span is the single point (0;0)  c) The span is the line y = 3x.  d) The span is all of.  e) The span is the line y = 2x.  f) The span is all of |

1. (2 points) Let S = {v1,v2,v3,v4,v5} where,

V1 = , V2 = , V3 = , V4 = , V5 =

Find a basis for the span Span(S).

## Reading homework:

* Linear Transformation and matrices: <http://amsi.org.au/ESA_Senior_Years/SeniorTopic8/8a/8a_2content_3.html>
* Linear combination, span, linear independence: <https://medium.com/linear-algebra-basics/vector-span-f90b989d712d>