MA322-001 Apr 28 Quiz Name: _____

The matrix A has the following columns.

```
octave> A
A =

      -3.03        5.43        1.74       -5.25        3.21
      -1.45        5.45         2.1       -2.75        4.15
      10.93       -5.33        0.06       17.75        1.49
       3.29        5.51        3.18        4.75        6.97
       0.26       10.94        4.92        -0.5       10.18

octave> [u,s,v] = svds(A,rank(A))
u =                          s =                          v =

       0.35       -0.15          24           0       -0.45       -0.25
       0.25       -0.25           0          20        0.45       -0.55
      -0.85       -0.35                                 0.1        -0.3
      -0.05       -0.55                              -0.75       -0.35
        0.3        -0.7                               0.15       -0.65
```

1. What value of $\vec{x}$ makes $A\vec{x}$ equal to the first column of A?

2. Write the first column of A in the form $x\vec{u}_1 + y\vec{u}_2$. What are x and y equal to?

3. Write $\vec{b} = \begin{bmatrix} -3.84 \\ -1.6 \\ 15.04 \\ 5.12 \\ 1.28 \end{bmatrix}$ in the form $x\vec{u}_1 + y\vec{u}_2 + err$. What are x and y now?

4. Which column of A is $\vec{b}$ closest to?