**Maths Worksheet - Matrices Solutions**

**Throughout these exercises A is the matrix given below:**

1 2

3 1

**1.** If v = [0,0], Av = [0,0]

**2.** If v = [3,6], Av = [1\*3+2\*6, 3\*3+1\*6] = [15, 15]

**3.** det(A) = 1\*1 – 2\*3 = -5

**4.** The inverse of A is

-1/5 2/5

3/5 -1/5

**5.** The matrix below represents a scaling (from the origin) of factor k

k 0

0 k

**6.** If B is the matrix in Q5, then BA =

k 2k

3k k

Note that every element of A has simply been multiplied by k

**7.** The matrix below presents rotation about the origin anti-clockwise by 45°

1/√2 -1/√2

1/√2 1/√2

**8.** By considering your answers to Q5-7, identify/describe the “compound” geometrical transformation that is represented by the matrix below

1 -1

1 1

This matrix is clearly formed from the matrix in Q7 by multiplying each of its elements by √2, therefore the matrix represents a 45° rotation (about the origin) following by a scaling (by a factor of √2) from the origin.

