## **VECTOR ALGEBRA**

Answer ALL questions in the spaces provided for your answers.

Where your answer is a fraction, write it as 1/3; -1/3; 5/4 or -7/2 where appropriate.

1. Given that  $\underline{a} = {5 \choose 2}$ ,  $\underline{b} = {6 \choose 0}$  and  $\underline{c} = {-3 \choose -2}$ , determine:

$$(\mathbf{a})\underline{a} + \underline{b} = ( )$$

(e) 
$$\underline{a} - 3\underline{b} - 4\underline{c} = ($$

(b) 
$$\underline{a} - \underline{b} = ($$

$$(\mathbf{f}) \ \frac{1}{2}\underline{b} = \left( \ \ \right)$$

(c) 
$$2\underline{a} - \underline{b} + \underline{c} = ($$

$$(g) \frac{1}{3} \underline{c} = \left( \right)$$

(d) 
$$3\underline{a} - 2\underline{b} - \underline{c} = ($$

2. Given that  $\underline{a} = \begin{pmatrix} 2 \\ 5 \end{pmatrix}$ ,  $\underline{b} = \begin{pmatrix} 3 \\ -3 \end{pmatrix}$  and  $\underline{c} = \begin{pmatrix} 4 \\ 6 \end{pmatrix}$ , determine the

following vectors:

(a) 
$$\underline{a} + \underline{b} = ($$

(e) 
$$3\underline{a} - \underline{b} + 2\underline{c} = ($$

**(b)** 
$$\underline{a} + \underline{b} + \underline{c} = ($$

(f) 
$$\frac{1}{2}\underline{a} - \underline{b} + \underline{c} = \left( \right)$$

(c) 
$$2\underline{a} + \frac{1}{3}\underline{b} = \left( \right)$$

$$(g) \ \underline{a} - \underline{b} + \underline{c} = \left( \quad \right)$$

(d) 
$$\underline{a} - \frac{2}{3}\underline{b} + \frac{1}{2}\underline{c} = \left( \right)$$

$$(h) \underline{a} + \underline{b} - \underline{c} = \left( \right)$$