1. On a coordinate plane, draw the vectors $a = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$ and $b = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$ and then draw $c = a + b$. Make dotted lines which illustrate how the point/vector $c$ can be reached by connecting the vectors $a$ and $b$ “tail-to-head”.

2. Use the following vectors to answer the questions:

   $v = \begin{pmatrix} 6 \\ -1 \end{pmatrix}$  $u = \begin{pmatrix} -2 \\ 1 \end{pmatrix}$  $x = \begin{pmatrix} 4 \\ 2 \\ 1 \end{pmatrix}$  $y = \begin{pmatrix} -1 \\ -2 \\ -3 \end{pmatrix}$  $e = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$

   a. Compute the following linear combinations, if possible:

      $2u + 3v =$  
      $u + e =$  
      $x - 2y + e =$  
      $-2u - v + e =$

   b. Compute the following inner products, if possible:

      $u^T v =$  
      $x^T u =$  
      $v^T x =$  
      $x^T x =$  
      $x^T e =$  
      $e^T v =$  
      $e^T y =$  
      $y^T e =$

   c. What happens when you multiply a vector by $e$?

   d. What happens when you take the inner product of a vector with itself (as in $x^T x$)?