

Math 124 - Fall 2016  
Some dot products to compute

Compute the dot product of the following vectors, if it exists. The solutions are on the next page, so don't peek until you are done!

a)  $\begin{pmatrix} 2 \\ -3 \end{pmatrix} \cdot \begin{pmatrix} -1 \\ 2 \end{pmatrix}$

b)  $\begin{pmatrix} 2 \\ -3 \\ 7 \end{pmatrix} \cdot \begin{pmatrix} -4 \\ 2 \\ 2 \end{pmatrix}$

c)  $\begin{pmatrix} 4 \\ -3 \end{pmatrix} \cdot \begin{pmatrix} 5 \\ -2 \\ 1 \end{pmatrix}$

d)  $\begin{pmatrix} 6 \\ 0 \\ -1 \end{pmatrix} \cdot \begin{pmatrix} 2 \\ -7 \\ -2 \end{pmatrix}$

Solutions

a)  $\begin{pmatrix} 2 \\ -3 \end{pmatrix} \cdot \begin{pmatrix} -1 \\ 2 \end{pmatrix} = (2) \cdot (-1) + (-3) \cdot (2) = -2 - 6 = -8$

b)  $\begin{pmatrix} 2 \\ -3 \\ 7 \end{pmatrix} \cdot \begin{pmatrix} -4 \\ 2 \\ 2 \end{pmatrix} = (2) \cdot (-4) + (-3) \cdot (2) + 7 \cdot (-4) = -8 - 6 + 14 = 0$

c) The dot product  $\begin{pmatrix} 4 \\ -3 \end{pmatrix} \cdot \begin{pmatrix} 5 \\ -2 \\ 1 \end{pmatrix}$  does not exist since the vectors are not the same size.

d)  $\begin{pmatrix} 6 \\ 0 \\ -1 \end{pmatrix} \cdot \begin{pmatrix} 2 \\ -7 \\ -2 \end{pmatrix} = (6) \cdot (2) + (0) \cdot (-7) + (-1) \cdot (-2) = 12 + 0 + 2 = 14$