(1 point) Find the value(s) of a making $\vec{v} = 2a\vec{i} - 3\vec{j}$ parallel to $\vec{w} = a^2\vec{i} + 9\vec{j}$.

$a =$ 0,-6

(If there is more than one value of a, enter the values as a comma-separated list.)

(1 point) Find the area of the parallelogram defined by the vectors

$$\begin{bmatrix} 2 \\ 1 \\ 2 \\ 1 \end{bmatrix}, \begin{bmatrix} -2 \\ -3 \\ 2 \\ 1 \end{bmatrix}.$$

Area = sqrt(10*18)*2sqrt(55)/15 .

(1 point) **(a)** Find a unit vector from the point $P = (3, 3)$ and toward the point $Q = (11, 18)$.

$\vec{u} =$ <8/17,15/17>

(b) Find a vector of length 34 pointing in the same direction.

$\vec{v} =$ <8*34/17,15*34/17>

(1 point) Let $\vec{a}, \vec{b}, \vec{c}$ and $\vec{y}$ be the three dimensional vectors

$$\vec{a} = 2\vec{j} + 2\vec{k}, \quad \vec{b} = -3\vec{i} + \vec{j} + 3\vec{k}, \quad \vec{c} = 2\vec{i} - 8\vec{j}, \quad \vec{y} = -\vec{i} + 7\vec{j}$$

Perform the following operations on these vectors:

(a) $\vec{c} \cdot \vec{a} + \vec{a} \cdot \vec{y} =$ -2

(b) $(\vec{a} \cdot \vec{b})\,\vec{a} =$ 16j+16k

(c) $((\vec{c} \cdot \vec{c})\,\vec{a}) \cdot \vec{a} =$ 68*8

(1 point) Let $\mathbf{a} = (6, 1, 8)$ and $\mathbf{b} = (2, 3, 8)$ be vectors.
Compute the cross product $\mathbf{a} \times \mathbf{b}$.

$\mathbf{a} \times \mathbf{b} =$(-16 , -32 , 16)

(1 point) For each of the following, perform the indicated operations on the vectors

$\vec{a} = 5\vec{j} + 5\vec{k}, \vec{b} = 4\vec{i} + 5\vec{j} + 5\vec{k}, \vec{z} = 4\vec{i} + 2\vec{j}.$

(a) $5\vec{a} + 2\vec{b} =$ 8i+35j+35k

(b) $7\vec{a} + 4\vec{b} - 3\vec{z} =$ 4i+49j+55k

(1 point) Find a representation of the vector $\overrightarrow{AB} = \langle -3, 16, 11 \rangle$ in $\mathbb{R}^3$ by giving appropriate values for the points A and B such that neither A nor B is the origin.

$A =$ (1,0,1) help (points)

$B =$ (-2,16,12) help (points)

(1 point) Find two vectors $\overline{v}_1$ and $\overline{v}_2$ whose sum is $\langle 4, -3, -2 \rangle$, where $\overline{v}_1$ is parallel to $\langle 1, 3, 0 \rangle$ while $\overline{v}_2$ is perpendicular to $\langle 1, 3, 0 \rangle$.

$\overline{v}_1 =$ <-1/2,-3/2,0> and

$\overline{v}_2 =$ <9/2,-3/2,-2> .