Exercise 1. Consider the vectors $\vec{u}=(1,3,4)$ and $\vec{v}=-2\hat{\jmath}+3\hat{k}$. Evaluate $3\vec{v}+2\vec{u}$.

1. Identify and explain the mistakes in the following procedures:

$$3(1,3,4)+2(-2\hat{\jmath}+3\hat{k})= \qquad (3+9+4)+(-4+6)=18$$

$$\begin{aligned} 3(0\hat{\imath}-2\hat{\jmath}+3\hat{k})+2(1,3,4) & \\ =(0\hat{\imath}-2\hat{\jmath}+3\hat{k})+(2,3,4) & \\ =(2,-1,7) &\stackrel{?}{=} 2\hat{\imath}-\hat{\jmath}+7\hat{k} \end{aligned}$$

2. Write out the correct procedure and answer.

Exercise 2. Consider the curve $r(t)=(t,(4-t^2)^2)$ for $1\leqslant t\leqslant 3$.

1. Find a parametrization of the line segment between the endpoints of this curve.
2. Find the velocity vector for this curve.
3. Verify the following given solution and correct it if there are any mistakes:

$$\begin{aligned} \text{Parametrization:} \quad & t(3)+(1-t)(1)=2t-1 \\ \text{Velocity vector:} \quad & v(t)=r'(t)=(1,-4t(4-t^2)) \end{aligned}$$