MA 166: Quiz 3

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You have **15 minutes** to complete this quiz. You may work in groups, but you are not allowed to use any other resources.

Problem 1. Let $\mathbf{u} = \langle 6, 3, 1 \rangle$, $\mathbf{v} = \langle 0, 1, 2 \rangle$, and $\mathbf{w} = \langle 4, -2, 5 \rangle$.

(i) Find the scalar projection $\text{comp}_{\mathbf{v}} \mathbf{w}$.

(ii) Find the projection $\text{proj}_{\mathbf{u}} \mathbf{v}$.

(iii) Find the cross product $\mathbf{v} \times \mathbf{w}$.

(iv) What is a vector orthogonal to $\mathbf{v}$ and $\mathbf{w}$?

(v) Find the scalar triple product $\mathbf{u} \cdot (\mathbf{v} \times \mathbf{w})$.

(vi) Are the vectors $\mathbf{u}$, $\mathbf{v}$, and $\mathbf{w}$ coplanar?

Problem 2. Find the area enclosed by the regions

(i) $y = x^3$, and $y = |x|$.

(ii) $y = e^x$, $y = e^2 x$, and $x = \ln 2$.