Name: ——————————————————   Section and/or TA: ——————————

1. (4 points) Let $\mathbf{v} = \langle 2, 3, -6 \rangle$.

   (a) (1 point) Find the projection $\mathbf{w}$ of $\mathbf{v}$ onto the xz-plane.

> **Solution:** Since the projection of the point $(2, 3, -6)$ onto the xz-plane is $(2, 0, -6)$, we have $\mathbf{w} = \langle 2, 0, -6 \rangle$.

   (b) (2 points) Find the cosine of the angle θ between $\mathbf{v}$ and $\mathbf{w}$.

> **Solution:** We have
> $$\cos(\theta) = \frac{\mathbf{v} \cdot \mathbf{w}}{|\mathbf{v}|\,|\mathbf{w}|} = \frac{40}{(\sqrt{49})(\sqrt{40})} = \frac{2\sqrt{10}}{7}.$$

   (c) (1 point) Is angle θ acute or obtuse?

> **Solution:** Since $\cos(\theta) > 0$, angle θ is acute.