

1 Divergence through a Prism

Consider the vector field $\vec{F} = (x + 2)\hat{x} + (z + 2)\hat{z}$.

- Calculate the divergence of \vec{F} .
- In which direction does the vector field \vec{F} point on the plane $z = x$? What is the value of $\vec{F} \cdot \hat{n}$ on this plane where \hat{n} is the unit normal to the plane?
- Verify the divergence theorem for this vector field where the volume involved is drawn below. (“Verify” means calculate both sides of the divergence theorem, separately, for this example and show that they are the same.)

