

**Solution** (#530) The normal direction to the plane  $\mathbf{r} \cdot \mathbf{n} = c$  is parallel to  $\mathbf{n}$ . The shortest distance from  $\mathbf{p}$  to the plane is measured along the normal – so the nearest point on the plane to  $\mathbf{p}$  is the form  $\mathbf{p} + \lambda_0 \mathbf{n}$  for some  $\lambda_0$ . This value is specified by the equation

$$(\mathbf{p} + \lambda_0 \mathbf{n}) \cdot \mathbf{n} = c \implies \lambda_0 = \frac{c - \mathbf{p} \cdot \mathbf{n}}{\mathbf{n} \cdot \mathbf{n}}.$$

The distance from  $\mathbf{p} + \lambda_0 \mathbf{n}$  to  $\mathbf{p}$  is

$$|\lambda_0 \mathbf{n}| = \left| \frac{c - \mathbf{p} \cdot \mathbf{n}}{\mathbf{n} \cdot \mathbf{n}} \right| |\mathbf{n}| = \frac{|c - \mathbf{p} \cdot \mathbf{n}|}{|\mathbf{n}|}.$$