

### Special Problem 2-5.9

Circle **all** of the following expressions that are **always** equal **zero**. No justification is necessary.

$$\mathbf{A} \cdot \mathbf{A}$$

$$\nabla \times \nabla \times \mathbf{A}(\bar{\mathbf{r}})$$

$$\nabla \cdot \nabla g(\bar{\mathbf{r}})$$

$$\nabla(\nabla \cdot \mathbf{A}(\bar{\mathbf{r}}))$$

$$\oint_S \nabla \times \mathbf{A}(\bar{\mathbf{r}}) \cdot \bar{d}\mathbf{s}$$

$$(\mathbf{A} \times \mathbf{B}) \cdot \mathbf{A}$$

$$\nabla \times \nabla g(\bar{\mathbf{r}})$$

$$\mathbf{A} \times \mathbf{A}$$

$$\nabla \cdot \nabla \times \mathbf{A}(\bar{\mathbf{r}})$$

$$\iint_S \nabla \times \mathbf{A}(\bar{\mathbf{r}}) \cdot \bar{d}\mathbf{s}$$

$$\oint_C \nabla g(\bar{\mathbf{r}}) \cdot \bar{d}\ell$$

$$\int_C \nabla g(\bar{\mathbf{r}}) \cdot \bar{d}\ell$$