

Differential Forms- HW Problems

Write all differential forms in standard form.

For problems 1-3 evaluate $\omega + \eta$ and $\omega \wedge \eta$.

1. $\omega = xdx + ydy$

$$\eta = ydx + xdy$$

2. $\omega = (x^2 + y^2)dx - x^2dy$

$$\eta = y^2dx + (x^2 + y^2)dy$$

3. $\omega = (xy^2z)dx + (y - x)dz$

$$\eta = x^2dy + (y^2)dz$$

For problems 4 and 5 find $\omega \wedge \eta$

4. $\omega = ydx + xdy + zdz$

$$\eta = xydx dy + y^2zdy dz + xdz dx$$

5. $\omega = dx dy + xdy dz + ydz dx$

$$\eta = xdx + ydy + zdz$$

In problems 6-9 find $d\omega$.

6. $\omega = xy + yz + xz$

7. $\omega = (x^2 + y^2)dx + (y^2 + z^2)dy + (x^2 + z^2)dz$

8. $\omega = dx + 3dy + xydz$

9. $\omega = 3zdx dy - xdy dz$