

p. 1151 (14.5)

Find the curl and divergence of the given vector.

5. $x^2\hat{i} - 3xy\hat{j}$

7. $2xz\hat{i} - 3y\hat{k}$

9. $\langle xy, yz, x^2 \rangle$

11. $\langle x^2, y - z, xe^y \rangle$

13. $\langle 3yz, x^2, x \cos y \rangle$

15. $\langle 2xz, y + z^2, zy^2 \rangle$

Determine if the given vector field is conservative and/or incompressible.

17. $\langle 2x, 2yz^2, 2y^2z \rangle$

19. $\langle 3yz, x^2, x \cos y \rangle$

21. $\langle \sin z, z^2e^{yz^2}, x \cos z + 2yze^{yz^2} \rangle$

23. $\langle z^2 - 3ye^{3x}, z^2 - e^{3x}, 2z\sqrt{xy} \rangle$

25. $\langle xy^2, 3xz, 4 - zy^2 \rangle$

27. $\langle 4x, 3y^3, e^z \rangle$

31. Label each expression as a scalar quantity, a vector quantity or undefined, if f is a scalar function and $\vec{F}$ is a vector field.

(a) $\nabla \cdot (\nabla f)$

(b) $\nabla \times (\nabla \cdot \vec{F})$

(c) $\nabla(\nabla \times \vec{F})$

(d) $\nabla(\nabla \cdot \vec{F})$

(e) $\nabla \times (\nabla f)$

Conjecture whether the divergent at point P is positive, negative or zero.

35. (Image in book)

37. (Image in book)

39. (Image in book)