p. 1107 (14.1)

Sketch several vectors in the vector field by hand and verify your sketch with a CAS.

6. $\vec{F}(x,y)=\dfrac{\langle -y,x\rangle}{\sqrt{x^2+y^2}}$

7. $\vec{F}(x,y)=\langle 0,x^2\rangle$

8. $\vec{F}(x,y)=\langle 2x,0\rangle$

9. $\vec{F}(x,y)=2y\hat{i}+\hat{j}$

15. (Problem and images in book)

Find the gradient field corresponding to *f*. Use a CAS to graph it.

19. $f(x,y)=\sqrt{x^2+y^2}$

21. $f(x,y)=xe^{-y}$

23. $f(x,y,z)=\sqrt{x^2+y^2+z^2}$

25. $f(x,y,z)=x^2y+yz$

Determine whether or not the vector field is conservative. If it is, find a potential function.

27. $\langle y,x\rangle$

29. $\langle y,-x\rangle$

31. $\langle x-2xy\rangle\hat{i}+\langle y^2-x^2\rangle\hat{j}$

33. $\langle y\sin xy, x\sin xy\rangle$

35. $\langle 4x-z,3y+z,y-x\rangle$

37. $\langle y^2z^2-1,2xyz^2,4z^3\rangle$

Find the equations for the flow lines.

39. $\langle 2,\cos x\rangle$

41. $\langle 2y,3x^2\rangle$

43. $y\hat{i}+xe^y\hat{j}$