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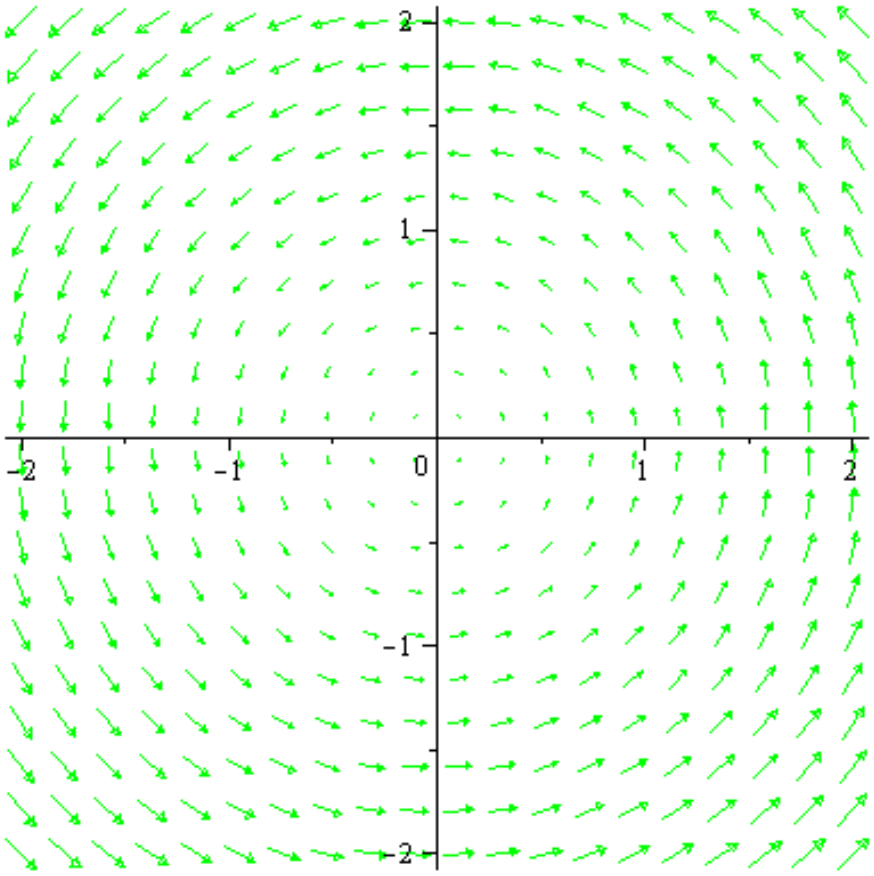
Medan Vektor

$$f(x, y) = -y\,\hat{\imath} + x\,\hat{\jmath}$$



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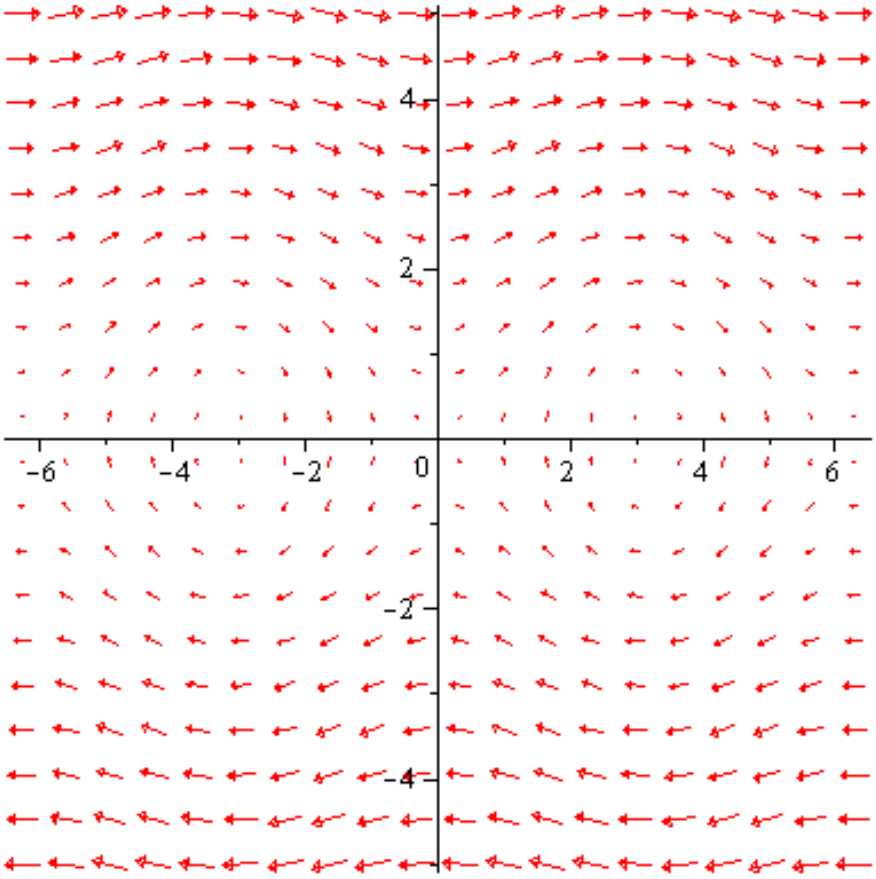
$$f(x, y) = y\,\hat{\imath} + \sin(x)\,\hat{\jmath}$$



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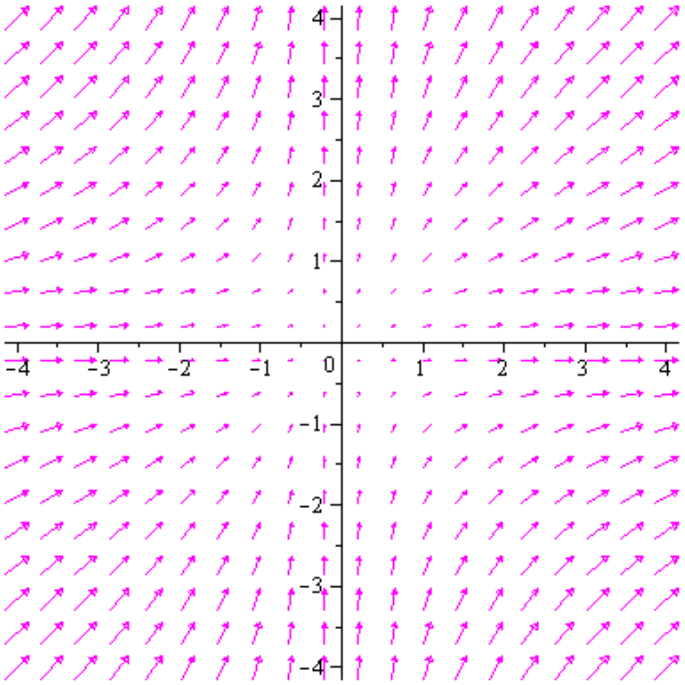
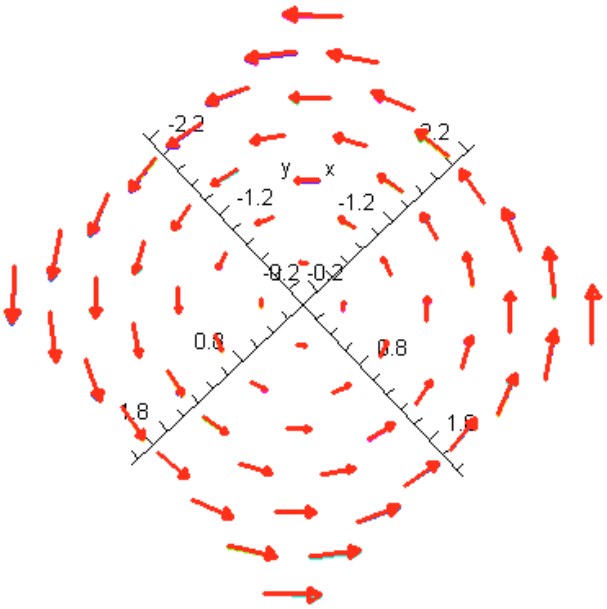
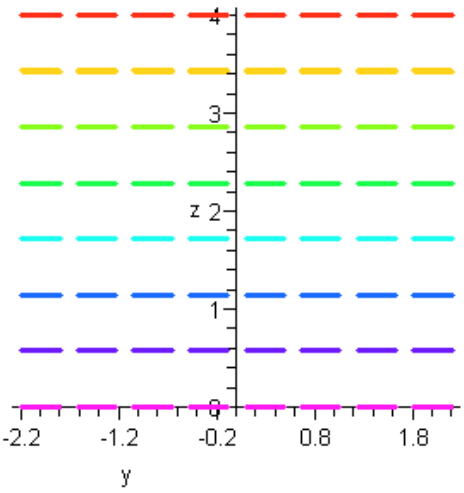
$$f(x, y) = \ln(1 + x^2)\,\hat{\imath} + \ln(1 + y^2)\,\hat{\jmath}$$



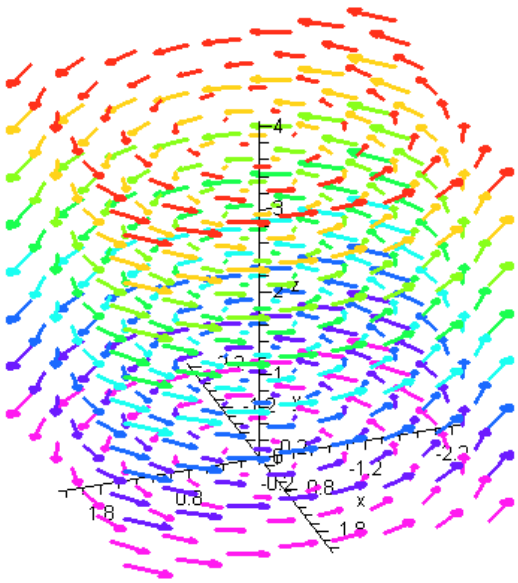
HURICANE : $f(x, y, z) = -y\,\hat{\imath} + x\,\hat{\jmath} + 0\,\hat{k}$

Bidang XOY Bidang YOZ



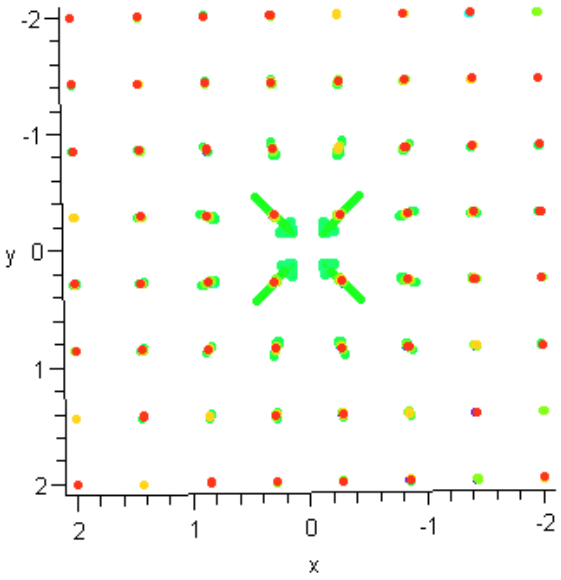


Tiga Dimensi

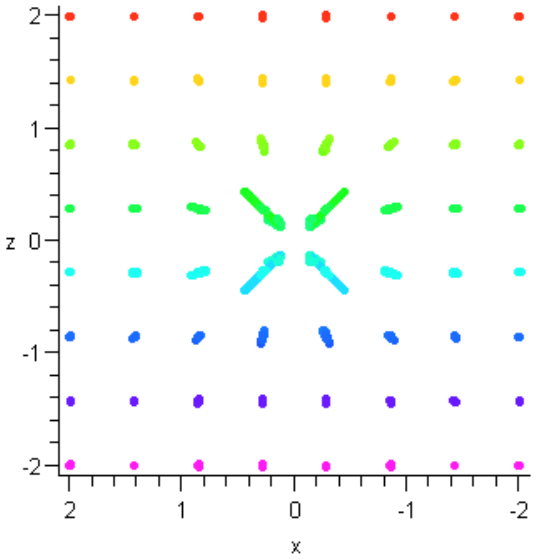


Gravity: $f(x, y, z) = x\,\hat{\imath} + y\,\hat{\jmath} + z\,\hat{k}$

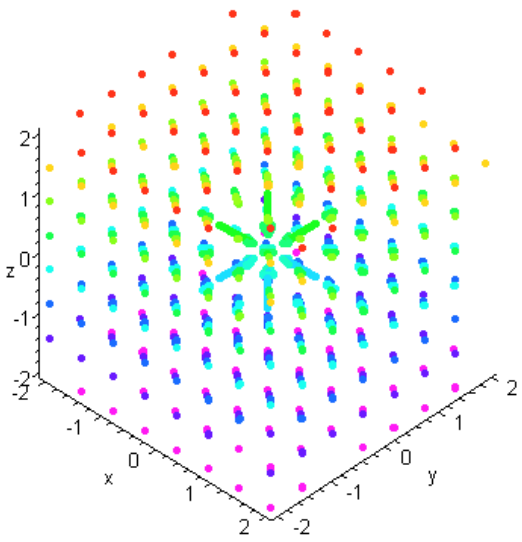
Bidang XOY



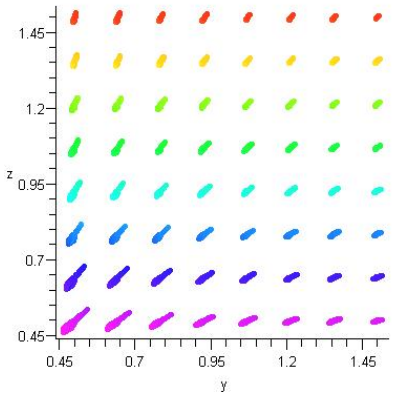
Bidang XOZ



Tiga Dimensi



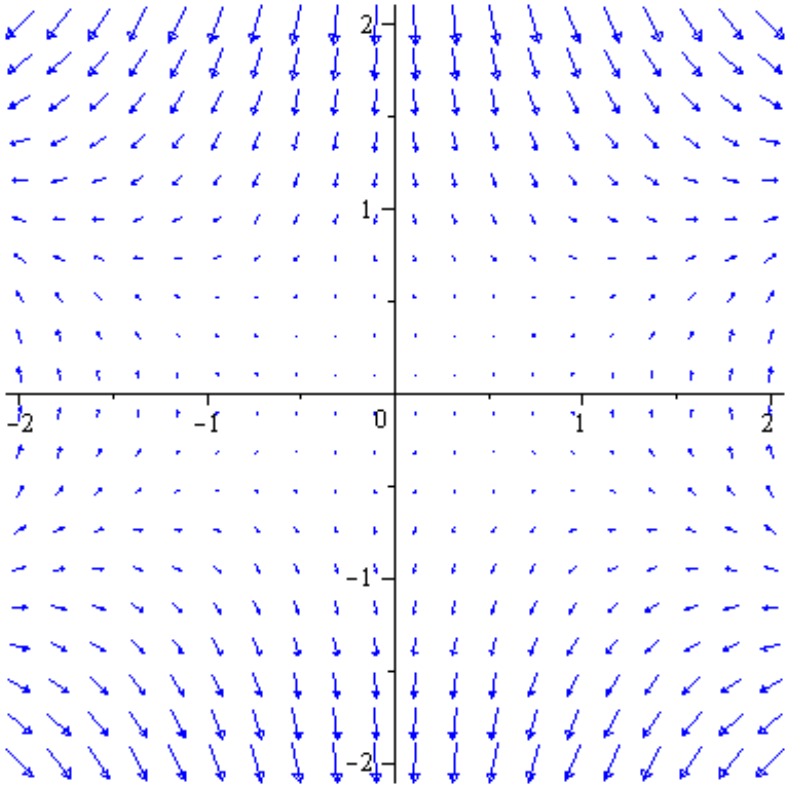
Pada kuadran pertama bidang YOZ



MEDAN GRADIEN

$$f(x,y) = x^2y - y^3$$

Untuk x dan y bertanda sama: arah thd x selalu ke kanan
Untuk x dan y berbeda tanda: arah thd x selalu ke kiri
Apabila turunan parsial thd y >0 maka arah ke atas
Apabila turunan parsial thd y < 0 maka arah ke bawah



$$f(x,y,z) = \frac{1}{\sqrt{x^2 + y^2 + z^2}}$$

Bidang XOZ

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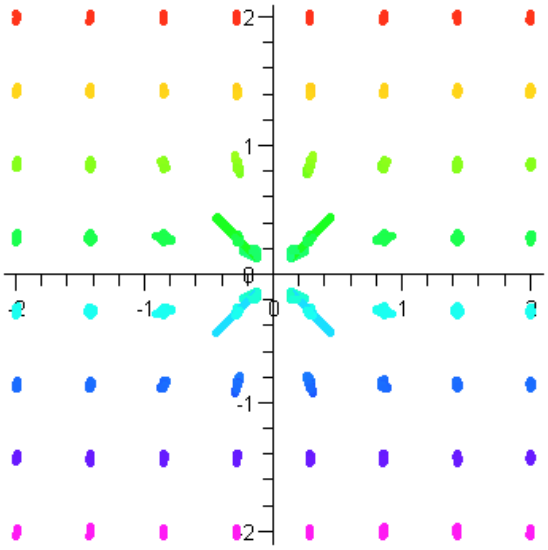

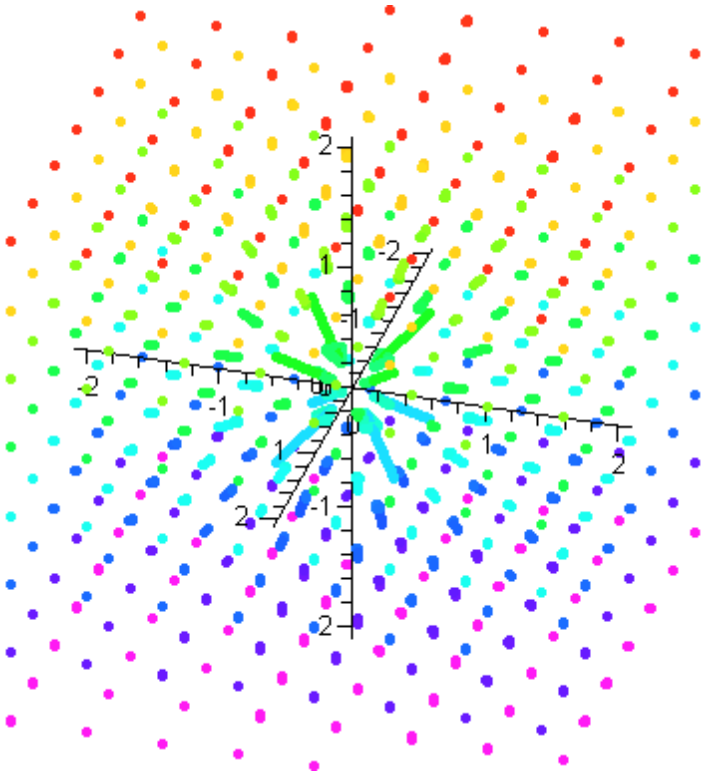

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Latihan:

1. Tuliskan persamaan parameter untuk garis lurus melalui titik (2,0,4) dan (-3,0,9).
2. Diberikan curva r(t) dan titik P:

   $\mathbf{r}(t) = [3\cos t, \quad 3\sin t, \quad 4t], \quad P: (3, 0, 8\pi)$

   Carilah vektor singgung r'(t) di titik P, sketsa gambarnya di bidang XOY dan dimensi 3.
3. Tentukan kurva isoterm (kurva yang memiliki suhu konstan T) dari fungsi berikut: a. T = xy b. $T = \frac{y}{x^2+y^2}$
4. Gambarkan medan vektor dari

   $\mathbf{v} = (x - y)\mathbf{i} + (x + y)\mathbf{j}$.
5. Diberikan $f = x^2 + y^2 - z$, $P: (1, 1, -2)$, $\mathbf{a} = [1, 1, 2]$. Tentukan turunan berarah f terhadap vektor a di titik P.