

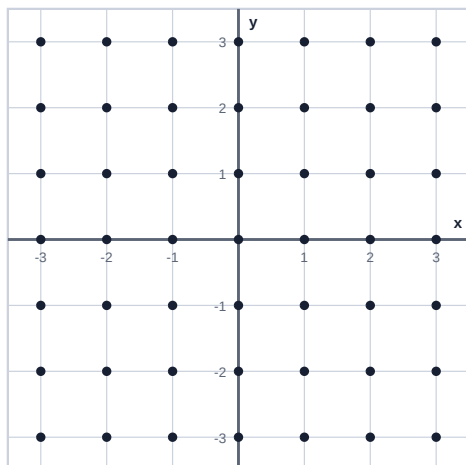
Drawing and Identifying Slope Fields

Sketch the direction field for each differential equation at all 49 marked lattice points.

A slope field shows local tangent directions, not a solution curve.

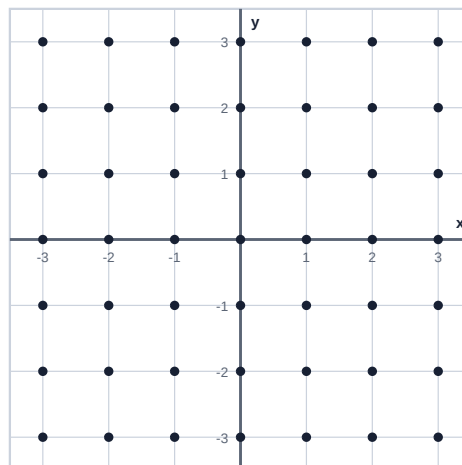
1.

$$\frac{dy}{dx} = -2$$



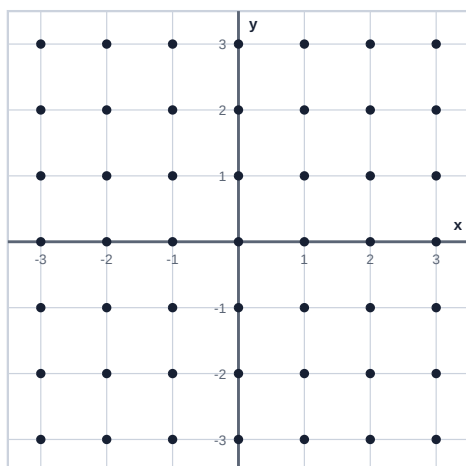
2.

$$\frac{dy}{dx} = -2 \cdot y$$



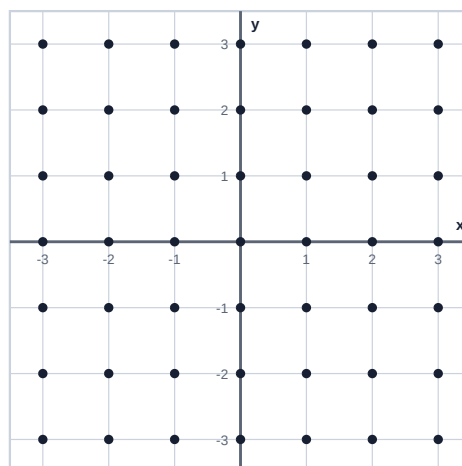
3.

$$\frac{dy}{dx} = -2 \cdot x^2 - 2 \cdot x \cdot y - 1 \cdot y^2 + 2 \cdot x - 2 \cdot y + 1$$



4.

$$\frac{dy}{dx} = x - 2 \cdot y - 2$$



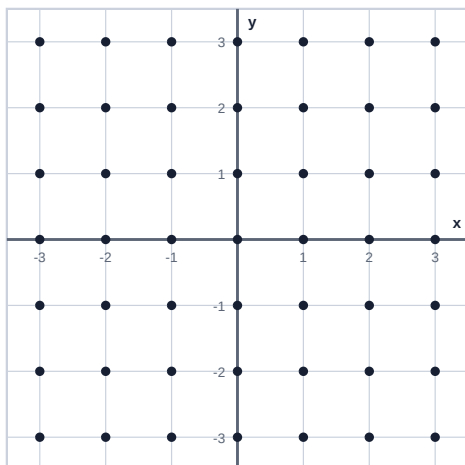
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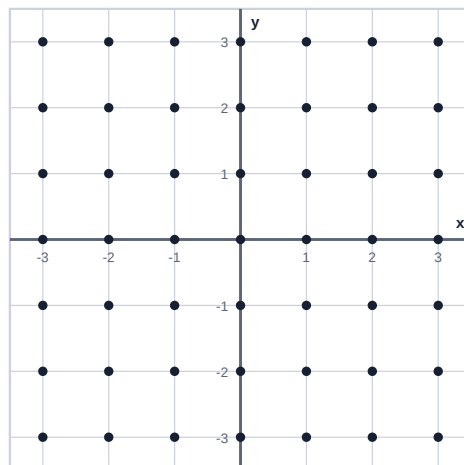
5.

$$\frac{dy}{dx} = -1 - x \cdot y$$



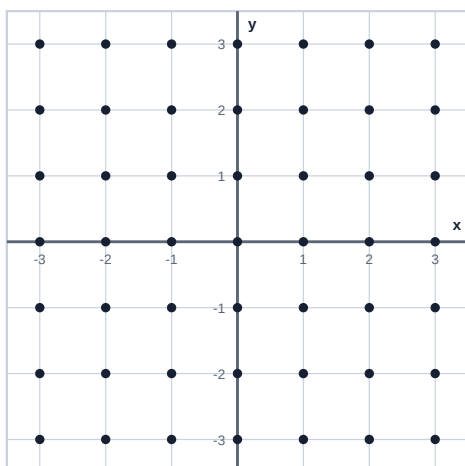
6.

$$\frac{dy}{dx} = -1 \cdot y^2 + 1$$



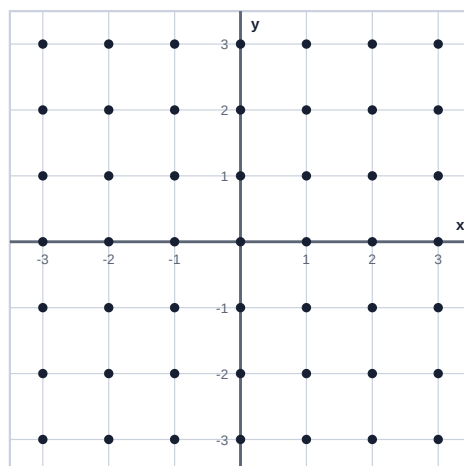
7.

$$\frac{dy}{dx} = x$$



8.

$$\frac{dy}{dx} = -1 \cdot x^2 - 1 \cdot x$$



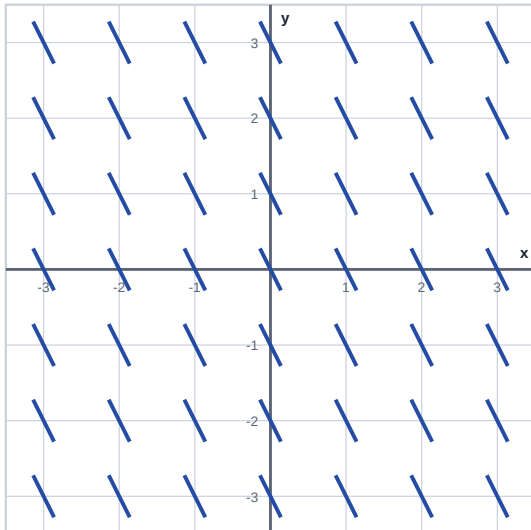
Drawing and Identifying Slope Fields

Worked Answer Key

Sketch the direction field for each differential equation at all 49 marked lattice points.

A slope field shows local tangent directions, not a solution curve.

1. Completed direction field

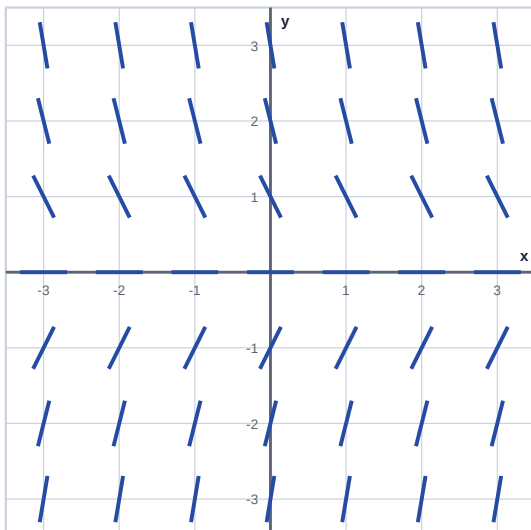


$$\frac{dy}{dx} = -2$$

Exact readings: $F(0,0)=-2$; $F(1,0)=-2$; $F(-1,0)=-2$; $F(0,1)=-2$; $F(0,-1)=-2$; $F(1,1)=-2$.

At each marked lattice point, substitute x and y into $F(x,y)$. Draw a short horizontal segment for slope 0, rising left-to-right for positive slope, and falling for negative slope. Keep every segment centered on its lattice point with the same physical length.

2. Completed direction field



$$\frac{dy}{dx} = -2 \cdot y$$

Exact readings: $F(0,0)=0$; $F(1,0)=0$; $F(-1,0)=0$; $F(0,1)=-2$; $F(0,-1)=2$; $F(1,1)=-2$.

At each marked lattice point, substitute x and y into $F(x,y)$. Draw a short horizontal segment for slope 0, rising left-to-right for positive slope, and falling for negative slope. Keep every segment centered on its lattice point with the same physical length.

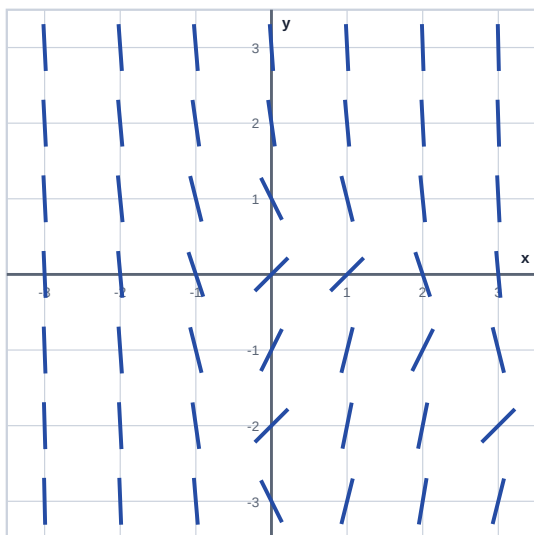
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3. Completed direction field

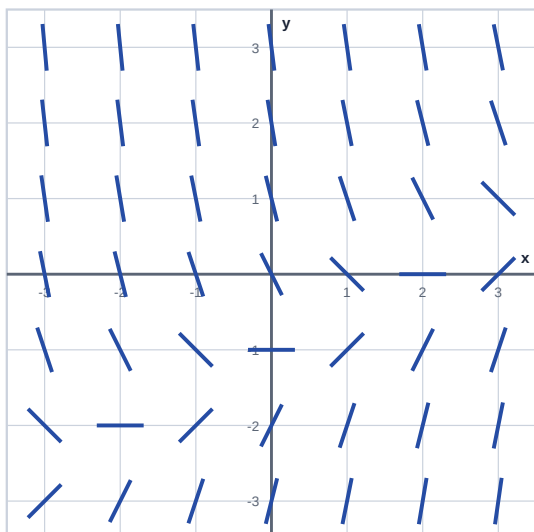


$$\frac{dy}{dx} = -2x^2 - 2xy - 1y^2 + 2x - 2y + 1$$

Exact readings: $F(0,0)=1$; $F(1,0)=1$; $F(-1,0)=-3$; $F(0,1)=-2$; $F(0,-1)=2$; $F(1,1)=-4$.

At each marked lattice point, substitute x and y into $F(x,y)$. Draw a short horizontal segment for slope 0, rising left-to-right for positive slope, and falling for negative slope. Keep every segment centered on its lattice point with the same physical length.

4. Completed direction field



$$\frac{dy}{dx} = x - 2y - 2$$

Exact readings: $F(0,0)=-2$; $F(1,0)=-1$; $F(-1,0)=-3$; $F(0,1)=-4$; $F(0,-1)=0$; $F(1,1)=-3$.

At each marked lattice point, substitute x and y into $F(x,y)$. Draw a short horizontal segment for slope 0, rising left-to-right for positive slope, and falling for negative slope. Keep every segment centered on its lattice point with the same physical length.

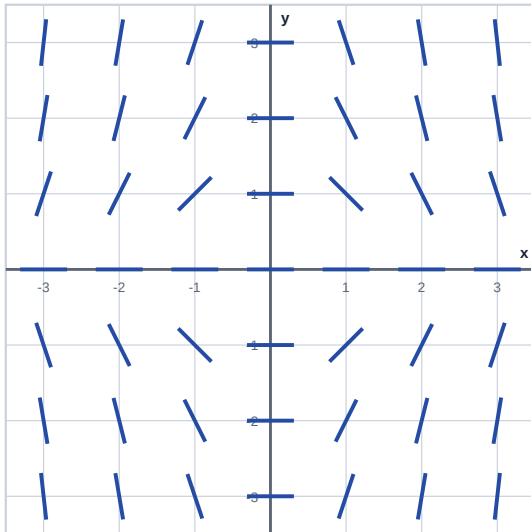
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5. Completed direction field

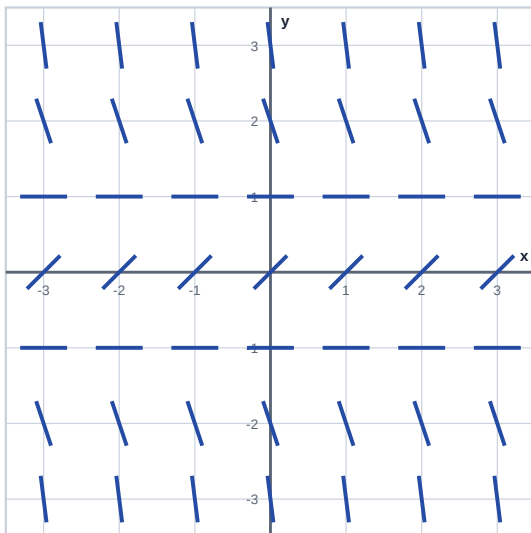


$$\frac{dy}{dx} = -1 \cdot x \cdot y$$

Exact readings: $F(0,0)=0$; $F(1,0)=0$; $F(-1,0)=0$; $F(0,1)=0$; $F(0,-1)=0$; $F(1,1)=-1$.

At each marked lattice point, substitute x and y into $F(x,y)$. Draw a short horizontal segment for slope 0, rising left-to-right for positive slope, and falling for negative slope. Keep every segment centered on its lattice point with the same physical length.

6. Completed direction field



$$\frac{dy}{dx} = -1 \cdot y^2 + 1$$

Exact readings: $F(0,0)=1$; $F(1,0)=1$; $F(-1,0)=1$; $F(0,1)=0$; $F(0,-1)=0$; $F(1,1)=0$.

At each marked lattice point, substitute x and y into $F(x,y)$. Draw a short horizontal segment for slope 0, rising left-to-right for positive slope, and falling for negative slope. Keep every segment centered on its lattice point with the same physical length.

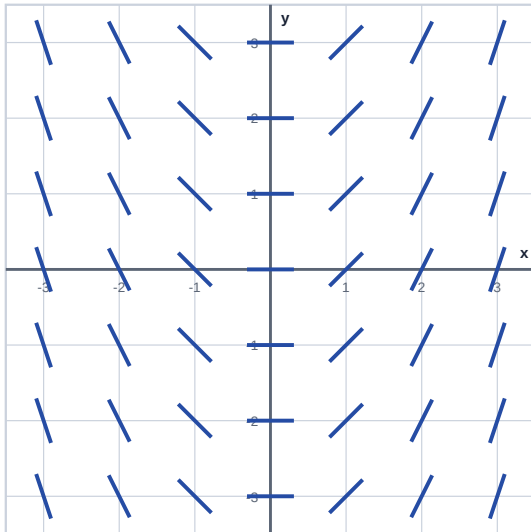
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7. Completed direction field

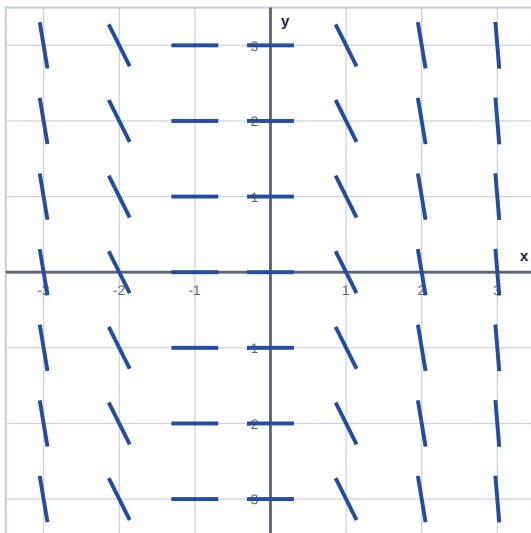


$$\frac{dy}{dx} = x$$

Exact readings: $F(0,0)=0$; $F(1,0)=1$; $F(-1,0)=-1$; $F(0,1)=0$; $F(0,-1)=0$; $F(1,1)=1$.

At each marked lattice point, substitute x and y into $F(x,y)$. Draw a short horizontal segment for slope 0, rising left-to-right for positive slope, and falling for negative slope. Keep every segment centered on its lattice point with the same physical length.

8. Completed direction field



$$\frac{dy}{dx} = -\frac{1}{2}x^2 - \frac{1}{2}x$$

Exact readings: $F(0,0)=0$; $F(1,0)=-2$; $F(-1,0)=0$; $F(0,1)=0$; $F(0,-1)=0$; $F(1,1)=-2$.

At each marked lattice point, substitute x and y into $F(x,y)$. Draw a short horizontal segment for slope 0, rising left-to-right for positive slope, and falling for negative slope. Keep every segment centered on its lattice point with the same physical length.