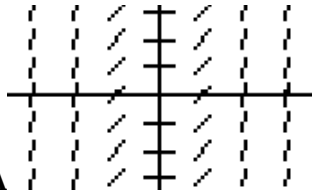
Matching Slope Fields with Differential Equations

A



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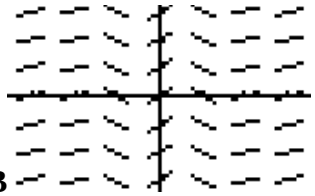

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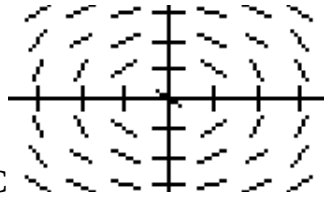

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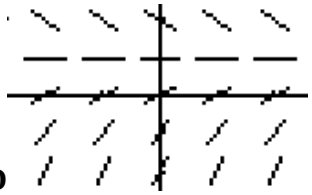

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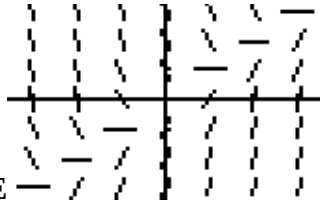

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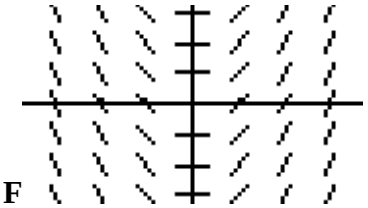

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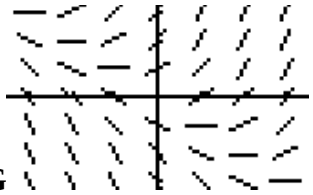

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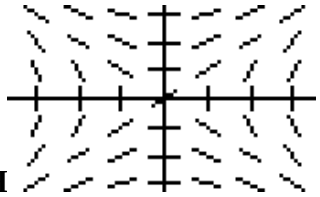

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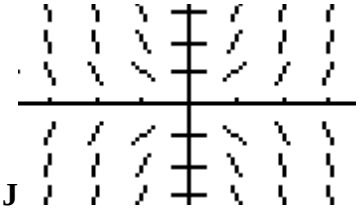

K

1. $\frac{dy}{dx} = 3x^2$

2. $\frac{dy}{dx} = 1 - y$

3. $\frac{dy}{dx} = \cos x$

4. $\frac{dy}{dx} = x - y$

5. $\frac{dy}{dx} = 2x$

6. $\frac{dy}{dx} = -\frac{x}{y}$

7. $\frac{dy}{dx} = x + y$

8. $\frac{dy}{dx} = \frac{y}{x}$

9. $\frac{dy}{dx} = xy$

10. $\frac{dy}{dx} = \frac{x}{y}$

ANSWER KEY

Slope Field	Sample Analysis about each Slope Field	Differential Equation
A	When $x = 0$, $dy/dx = 0$. When $x \neq 0$, $dy/dx > 0$.	1
B	When $x = 0$, dy/dx = constant. Depends only on x.	3
C	When $x = 0$, $dy/dx = 0$. When $y = 0$, dy/dx DNE. When $x > 0$ and $y > 0$ (Quad I), $dy/dx > 0$.	6
D	Depends only on y	2
E	When $x = y$, $dy/dx = 0$.	4
F	When $x = 0$, $dy/dx = 0$. When $x > 0$, $dy/dx > 0$. When $x < 0$, $dy/dx < 0$.	5
G	When $-x = y$, $dy/dx = 0$.	7
H	When $x = 0$, $dy/dx = 0$. When $y = 0$, dy/dx DNE. When $x > 0$ and $y > 0$ (Quad I), $dy/dx < 0$.	10
J	When $x = 0$, $dy/dx = 0$. When $x > 0$ and $y > 0$ (Quad I), $dy/dx < 0$. When $x > 0$ and $y < 0$ (Quad IV), $dy/dx > 0$.	9
K	Process of Elimination	8