

February 20

$$\frac{dy}{dx} = \underline{\hspace{2cm}}$$

What does a differential equation tell you about the original function?

Differentiable

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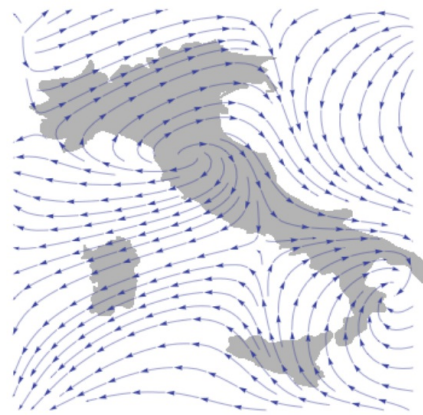
Students will verbally explain how to draw a slope field given a differential equation
(using the words:
point, slope, segment...)

Slope Field

shows the tangent line
of a function at
given points

- given the derivative
draw short line
segments to show
the slope at a point

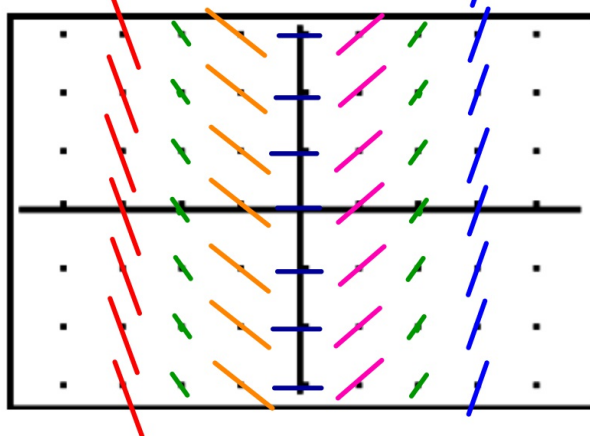
• generated by the
derivative but look
like the function



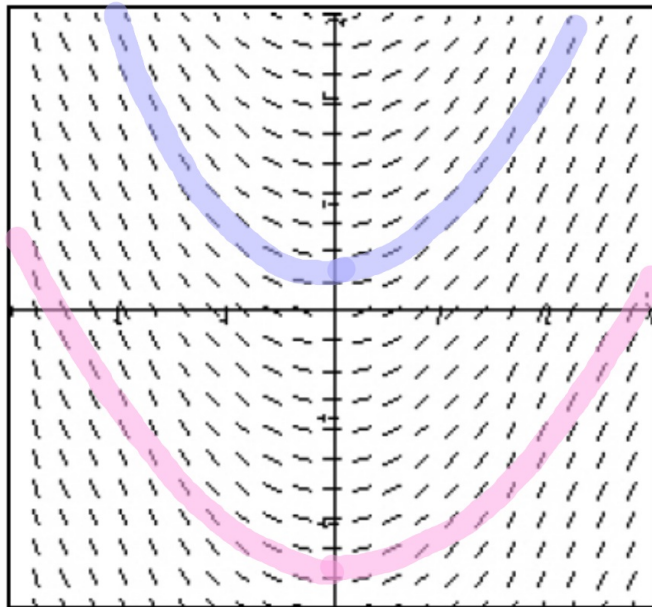
Given the function: $y = 0.5x^2$ Write the derivative: $\frac{dy}{dx} = x$

At each grid point, calculate the value of the derivative and draw a short line segment with that slope.

point	derivative
$(1,1)$	$\frac{dy}{dx} = 1$
$(2,2)$	2
$(3,4)$	3
$(3,3)$	3
$(-1,-1)$	-1
$(-3,3)$	-3



Sketch a function that matches this slope field.



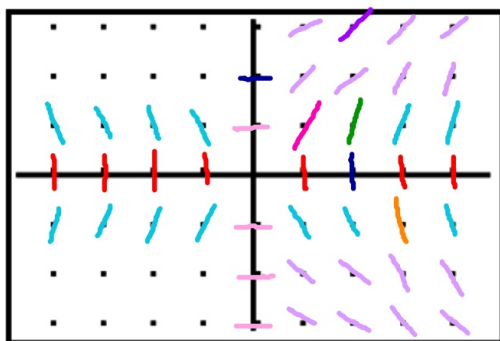
parabola

What family of functions seems to match this slope field?

$$y = x^2$$

quadratic

If $\frac{dy}{dx} = \frac{2x}{y}$ sketch the slope field



point	slope
(1,1)	$\frac{2(1)}{1} = 2$
(2,3)	$\frac{2(2)}{3} = \frac{4}{3}$
(2,1)	$\frac{2(2)}{1} = 4$
(3,-1)	$\frac{2(3)}{-1} = -6$
(2,0)	$\frac{2(2)}{0} = \text{und}$