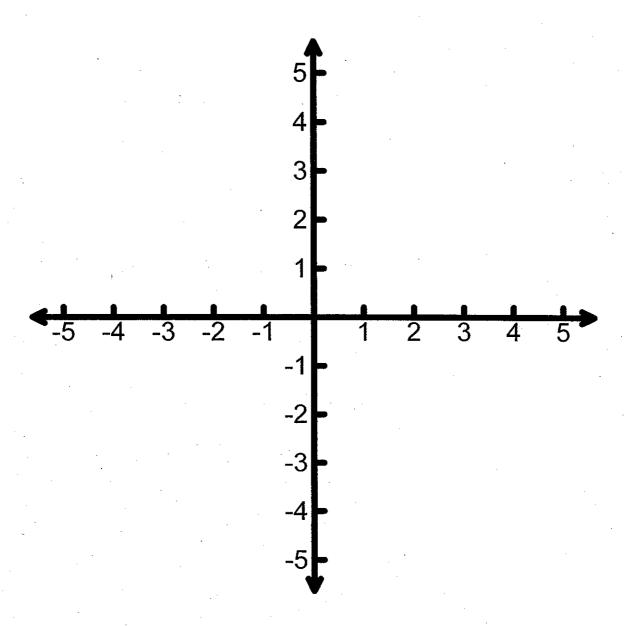
## Warm Up - Do with a partner!

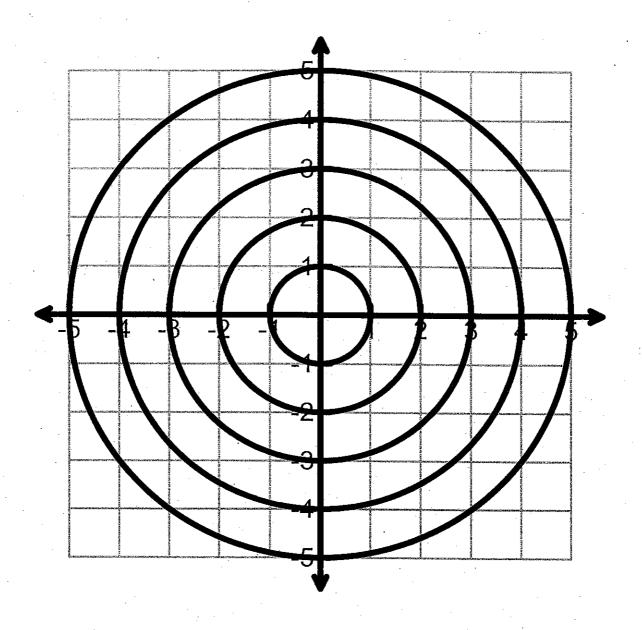
- Find dy/dx:
  - $-1. x^2 + y^2 = 4$
  - $-2. x^2 + y^2 = 9$
  - $-3. x^2 + y^2 = 25$
- On the given transparency, at each grey vertical grid line draw a small tangent line (about 1/8 to 1/4 inch long) to each circle.

## Continued

- Remove the transparency from the background sheet.
- The graph on the transparency is called a slope field. It's a way to visualize a first-order differential equation. In this case, your transparency shows the slope field for

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



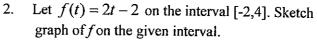


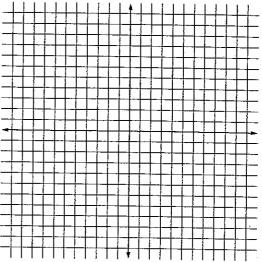
## Sketching "Area Functions"

1. Find  $F(x) = \int (2x-2)dx$ 

		g

Name





3. Using your graph of f, sketch the graph of  $A(x) = \int_{0}^{x} (2t-2)dt$  on the interval. (The y-value of a point (x,y) on function A represents area in the graph of f from t=0 to t=x.)

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$$y = A(x) =$$

Use the Fundamental Theorem of Calculus to derive the actual function for A.

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	$A(x) = \int_{0}^{x} (2t - 2)dt$ on the interval. (The y-value
	of a point $(x,y)$ on function A represents area in the graph of f from $t = 1$ to $t = x$ .)

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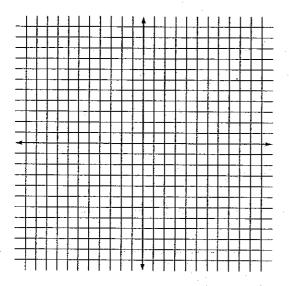
$$y = A(x) =$$

Use the Fundamental Theorem of Calculus to derive the actual function for A.

5. Using your graph of f, sketch the graph of

$$A(x) = \int_{0}^{x} (2t - 2)dt$$
 on the interval.

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$$y = A(x) = \underline{\hspace{1cm}}$$

Use the Fundamental Theorem of Calculus to derive the actual function for A.

7. How are the graphs similar?

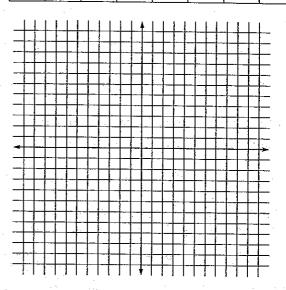
$$\int_{a}^{x} f(t)dt = \underline{\hspace{1cm}}$$

$$F(x) = \underline{\hspace{1cm}}$$

6. Using your graph of f, sketch the graph of

$$A(x) = \int_{0}^{x} (2t - 2)dt$$
 on the interval.

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x	-2	-1	0	1	2	3	4
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$$y = A(x) =$$

Use the Fundamental Theorem of Calculus to derive the actual function for A.