a. $h(1) = \int_1^1 f(t)\,dt = 0$

b. $h'(4) =$

$$h'(x) = \frac{d}{dx}\left(\int_1^x f(t)\,dt\right)$$

$$h'(x) = f(x)(1) - \cancel{f(1)(0)}$$

$$h'(4) = f(4) = 2$$

c. $(1,3) \cup (6,7)$

slopes on $f(x)$ are $(+)$ $\therefore$ 2^{nd} der. is $(+)$ and $h(x)$ is concave up.

6.1a

17. $$\frac{dy}{dt} = \frac{1}{1+t^2} + 2^t \ln 2$$

$t = 0$
$y = 3$

$$y = \tan^{-1} t + 2^t + C$$

10.

$$\frac{dy}{dx} = 4(\sin u)^3 \cos u$$

$$\frac{\cancel{4}(\sin u)^{3+1} \cancel{\cos u}}{\cancel{4} \cancel{\cos u}}$$

$$y = (\sin u)^4 + C$$

11.

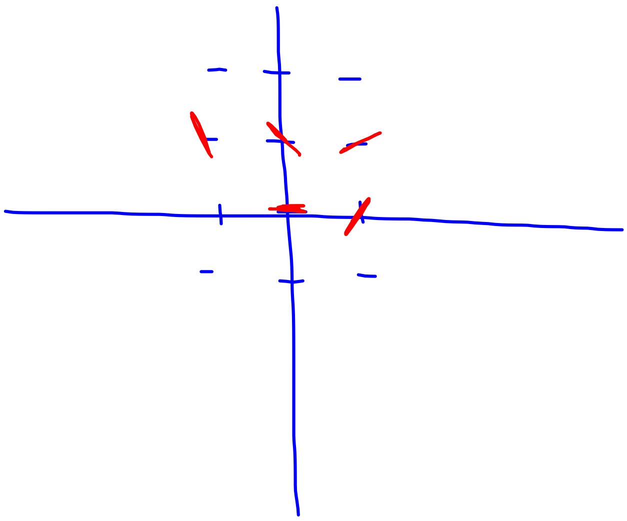
$$\frac{dy}{dx} = 3\sin x \qquad y_{x=0} = 2$$

$$3(-\cos x) + C$$

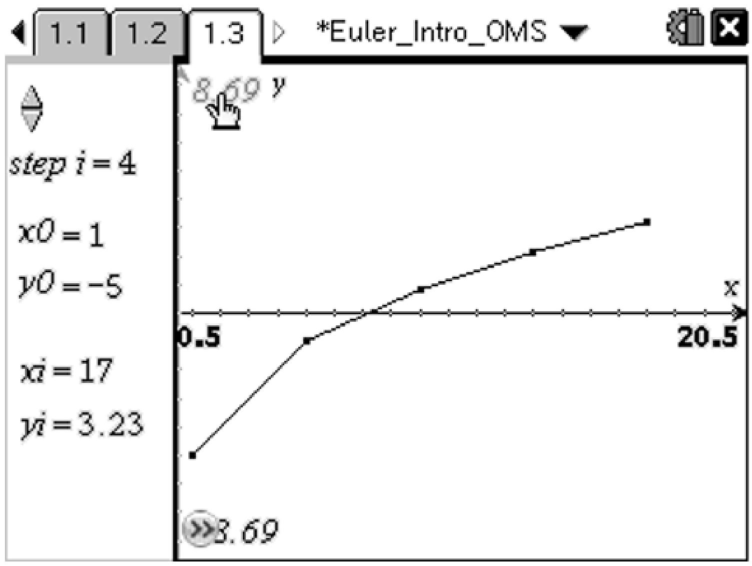
$$y = -3\cos x + C$$

32.

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



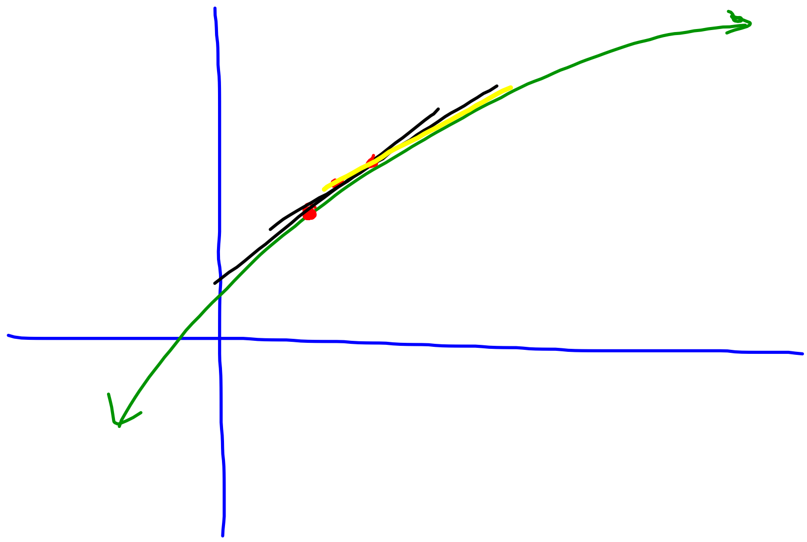
6.1b Euler's method



$$y_{n+1} = y_n + \frac{dy}{dx} * \Delta x$$

$$y_{new} = y_{current} + \frac{dy}{\cancel{dx}} \cdot \cancel{\Delta} x$$

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



$\frac{dy}{dx} = x + y$ $\qquad f(2) = 0$

Use Euler's method with steps of 0.2 to approximate $f(3)$.

$y_{curr} + \frac{dy}{dx} \Delta x = y_{new}$

$0 + (2)(.2) = .4$

$.4 + (2.6)(.2) = .92$

$.92 + (\quad)(.2)$

2, 0

(2.2, .4)

(2.4, .92)

2.6

2.8

3.0

$$\frac{dy}{dx} = 2xy, \quad y = 3 \text{ when } x = 2$$

Use Euler's method with five equal steps to approximate y when x = 1.5

$y_{curr} + \frac{dy}{dx}(\Delta x)$

2	3	$3 + (12)(-.1) = 1.8$
1.9	1.8	$1.8 + (6.84)(-.1) = 1.116$
1.8		
1.5		