7.5 Euler's Method

CA #1

Calculus   Name: ______________________________

1. The table below gives the values of f', the derivative of f. If $f(1.4) = 3$, what is the approximation to $f(2.6)$ obtained by using Euler's method with 3 steps of equal size?

$\boldsymbol{x}$	1	1.4	1.8	2.2	2.6
$\boldsymbol{f'(x)}$	.1	.3	.5	.8	1.2

2. The table below gives the values of f', the derivative of f. If $f(0) = 7$, what is the approximation to $f(1)$ obtained by using Euler's method with 2 steps of equal size?

$\boldsymbol{x}$	0	0.5	1.0
$\boldsymbol{f'(x)}$	$-.5$	$-.3$	$-.1$

3. Let $y = f(x)$ be the solution to the differential equation $\frac{dy}{dx} = x + y$ with initial condition $f(0) = 3$. What is the approximation for $f(0.5)$ obtained using Euler's method with 2 steps of equal length, starting at $x = 0$?

4. Let $y = f(x)$ be the solution to the differential equation $\frac{dy}{dx} = \frac{1}{x}$ with initial condition $f(1) = 2$. What is the approximation for $f(1.4)$ obtained using Euler's method with 4 steps of equal length, starting at $x = 1$?

5. Let $h(x) = \int_0^x \sqrt{1 + 4t^2}\, dt$. Use Euler's method, starting at $x = 0$ with two steps of equal size, to approximate $h(3)$.

Answers to 7.5 CA #1

1. $f(2.6) \approx 3.64$	2. $f(1.0) \approx 6.6$	3. $f(0.5) \approx 4.75$	4. $f(1.4) \approx 2.351$	5. $h(3) \approx 6.243$