

Practice Quiz Solutions

Quiz 1:

1) a) 12.5 days

b) $S > 400$

c) $S(1) \approx 9000$
 $I(1) \approx 1100$
 $R(1) \approx 1200$

2)
$$\begin{array}{r} 11 \\ 23 \\ 36 \\ 12 \end{array}$$

Quiz 2:

1) $S(120) \approx 51.19$

$I(120) \approx 16.66$

$R(120) \approx 49932.15$

2)
$$\begin{array}{r} 11 - 11 \\ 12 - 23 \\ 13 - 36 \\ -10 \end{array}$$

3)

Δt	$y(2.5)$
.1	3.756
.01	3.763
.005	3.763

When $\Delta t = .01$
 there seems
 to be two
 decimals accurate

Quiz 3:

1) (by hand)

t	y	y'	Δy
0	0	4	2
.5	2	16/5	8/5
1	18/5		

$y(1) \approx 18/5$

2) (by hand) $X_0 = 1, X_1 = 3/2, X_2 = 17/12$

Quiz 4: 1) $\frac{|x-900|}{900} < 10^{-3} \rightarrow |x-900| < .9$
 $\rightarrow x$ is in $(899.1, 900.9)$

2) $\max = f(16/5) = f(3.2)$

Quiz 5: 1) Use error $k < \frac{2-0}{2^{k+1}} < \frac{2}{2} 10^{-2} \leftrightarrow 2^k > 10^2$
 $k > \frac{\log 100}{\log 2} \approx 6.64$

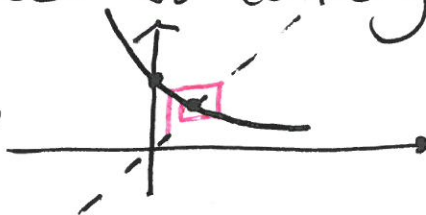
so 7 iterations will suffice. $x_7 \approx 1.414$

Quiz 6: (by hand)

1a) after guessing I found the interval $[0, 1]$.

since $\max |g'(x)| = 2^{-x} \ln 2 < 0.69$ on $[0, 1]$

FPI is guaranteed to converge to the fixed point in $[0, 1]$.



$x_0=0, x_1=1, x_2=\frac{1}{2}$

To estimate accuracy I will use $p = 7/10$ since $p^2 < 1/2$
 I know that one digit will stabilize after 8 iterations.
 To get 10^{-2} , take 16 iterations.

Quiz 7: (by hand) $x_0 = -1, x_1 = -2/3, x_2 = -4/9$