

Calculus 112 Practice Problems

Section 11.3 Problems #1, #4

1. (a) In Table 11.2, we see that $y(0.4) \approx 1.5282$.
 (b) In Table 11.3, we see that $y(0.4) = -1.4$. (This answer is exact.)

Table 11.2 Euler's method for $y' = x + y$ with $y(0) = 1$

x	y	$\Delta y = (\text{slope})\Delta x$
0	1	$0.1 = (1)(0.1)$
0.1	1.1	$0.12 = (1.2)(0.1)$
0.2	1.22	$0.142 = (1.42)(0.1)$
0.3	1.362	$0.1662 = (1.662)(0.1)$
0.4	1.5282	

Table 11.3 Euler's method for $y' = x + y$ with $y(-1) = 0$

x	y	$\Delta y = (\text{slope})\Delta x$
-1	0	$-0.1 = (-1)(0.1)$
-0.9	-0.1	$-0.1 = (-1)(0.1)$
-0.8	-0.2	$-0.1 = (-1)(0.1)$
-0.7	-0.3	
\vdots	\vdots	
0	-1	Notice that y decreases by 0.1
\vdots	\vdots	
0.4	-1.4	for every step

4. (a) See Table 11.6. At $x = 1$, $y \approx 0.16$.
 (b) See Figure 11.15.

Table 11.6

x	y	$\Delta y = (\text{slope})\Delta x$
0	0	0
0.2	0	0.0016
0.4	0.0016	0.0128
0.6	0.0144	0.0432
0.8	0.0576	0.1024
1	0.1600	

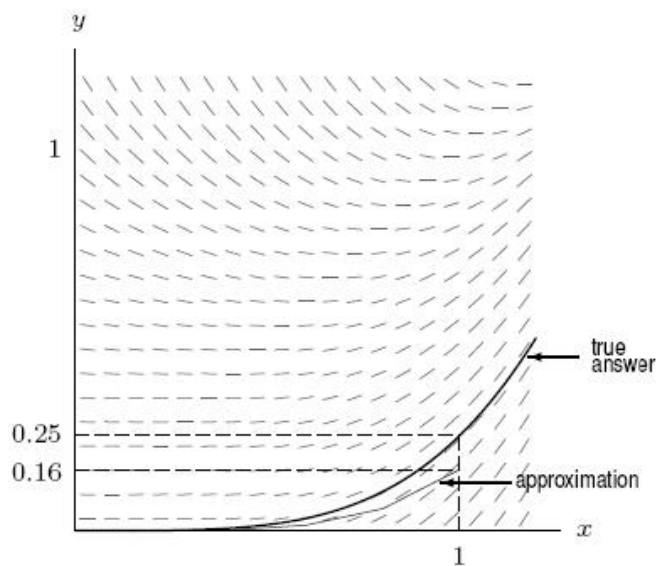


Figure 11.15

- (c) Our answer to (a) appears to be an underestimate. This is as we would expect, since the curve is concave up.

