

difference polynomials of degree 1, 2, 3.  
 Find the error of the interpolates for  
 $f(1.75)$ . Found the error bounds for  
 $E_1(x, f)$  . . . . .

Solution: Here is the DD table for  $f(x) = x^2 e^{-x/2}$

$x_i$	$f[x_i]$	I DD	II DD		
1.1	0.6981				
2	1.4715	0.8593			
3.5	2.1287	0.4381	-0.1755		
5	2.0521	-0.0511	-0.1631	0.0032	
7.1	1.4480	-0.2877	-0.0657	0.0191	0.0027

$$P_1(x) = 0.6981 + 0.8593(x - 1.1)$$

$$P_2(x) = P_1(x) - 0.1755(x - 1.1)(x - 2)$$

$$P_3(x) = P_2(x) + 0.0032(x - 1.1)(x - 2)(x - 3.5)$$

$$f(1.75) = 1.2766$$

$$P_1(1.75) = 0.6981 + 0.8593(1.75 - 1.1) = 1.25665$$

$$P_2(1.75) = P_1(1.75) - 0.1755(1.75 - 1.1)(1.75 - 2) = 1.2852$$

$$P_3(1.75) = P_2(1.75) + 0.0032(1.75 - 1.1)(1.75 - 2)(1.75 - 3.5) = 1.2861$$