

# [Math problems](https://assignbuster.com/math-problems/)

Find the least integer n for which pn(2) approximates f(2) with three decimal place accuracy From f(a+h) approximately f(a)+h f(a)   
When h is small enough in terms of value of f(a) and f(a)   
it is possible to approximate the value of   
f (a+h)   
For this case   
let approximate the value   
Of 2. 1   
Therefore 2. 1 can be expressed as   
2. 1 = 2+ h where   
h = 0. 1   
Assuming f(x) = x   
Then f1(x) = 1/2x   
Therefore , by linear approximation formula   
x+h= x +h/2x   
And then   
2. 1= 2+0. 1/22=   
2. 1= 2+0. 035   
= 1. 4495   
Use Tylor polynomials to estimate the following to within 0. 01   
e0. 8   
ex = 1 + x + x2 + x3 +..+ xn   
2 3 n   
e0. 8 = 1 + 0. 8 + 0. 82 + 0. 83 + . + 0. 8n   
2 3 n   
= 1 + 0. 8 + 0. 82 + 0. 83   
2 3   
= 1 + 0. 8 + 0. 64 + 0. 212   
2 6   
= 1 + 0. 8 + 0. 32 + 0. 0353   
= 2. 1553   
Expand as indicated   
Ln (x2)   
Let x2 be (x-1)2   
Where 2 is constant   
= then   
Ln (x-1)2= 2{(x-1)2/(x+1)2} +1/3{(x-1)3 /(x+2)3} + 1/5{(x-5)5/(x+5)5}   
For x > 0   
For   
(a+b) n = an + n/1! a n-1b + n(n-1)/2!\* an -2 b2.   
For this case, let 1 be a and 2x be b   
Therefore,   
(1-2x)-3   
= 1-3+3/11\*1-3 2\* + -3(-4)/2! \* 1-5 +4x2 + ..   
=-1+ {(-3/1!\*1-4\*(\_2x)} +   
(-3(-4)/2\*1-5\*4x2) +.   
= -1+6x +24x2 +2   
= 24x2+6x-1+2   
Find interval of convergence   
(-1) k (2/3) k (x+1) k   
Lim (-1) k+1 (2/3) k+1 (x+1) k+1   
(-1) k (2/3) k (x+1) k   
Lim (-1) (2/3) (x+1)   
1   
= -2/3 (x+1)   
=-(x+1) lim 2/3   
= -x-1 lim 2/3   
= -2/3 x+1 Therefore interval   
-2/3 x+1 < 1 Convergence.   
2 1/k k   
(x-2) k   
K (k+1) (k+2)   
Lim 2 1/r k   
(x-2) k 1/k   
  
K (k+1) (k+2) (k+1)   
Lim 2 1/k k (x-2) k+1   
0   
k (k+1)2 (k+2)   
= x-2 2 1/k k (x-2) k+1   
  
k (k+1)2 (k+2)   
= 0   
Therefore, f = 0 < 1   
Evaluation of the given limits   
Lim ex - 1 - x   
x tan -1 c   
Using hospital rule,   
Lim ex - 1 - x   
x tan -1 c = Lim ex - 1   
Tan -1c   
As the ex - 1 and tan -1c tends to zero, then   
Lim ex   
tan -1c   
= 1=+   
o   
Estimate within 0. 01   
  
1   
e-3x dx   
0   
  
= [e-3x] 1   
0   
  
= [e-1 - e0]   
= [0. 368 -1]   
= -0. 632   
Reference   
Karner. G and Kuich. W, (1997). " Characterizations of Abstract Families of Algebraic Power Series".