Question: The infinite series f(n) = sigma_k = 1^n 1/k^4 converges on a value f(n) = pi^4/90 as n approach...

3. The infinite series

$$f(n) = \sum_{k=1}^{n} \frac{1}{k^4}$$

converges on a value $f(n) = \pi^4/90$ as n approaches infinity. Write a program to calculate $f(n)$ for $n = 10,000$ by computing the sum from k=1 to 10,000. Then repeat the calculations but in reverse order - that is, from k=10,000 to 1 using increments of -1. In each case, compute the true percent relative error after each term is added. Compare the final error in the end of the calculations for the two cases. Explain the results.

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Expert Answer

Anonymous
answered this

the program in c# will be as follows.

```
int sum=0;

for (int n=1;n<=10000 ;n++)

{

sum=sum+1/n*1/n*1/n*1/n ;

}

Console. Write(sum) ;
```

Program written from other end of the series

int sum=0;

for (int n=10000; n<=1;n--)

{

sum=sum+(1/n)^4;

}

Console.write(sum) ;

use the following formula to estimate the percent relative error

Percent_error1=abs((y1-f(x1). /f(x1)) ;

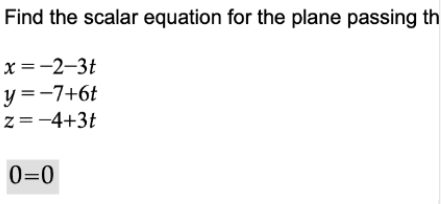
Sum=sum+Percent_error1;

0 Comments

Was this answer helpful? 0 0

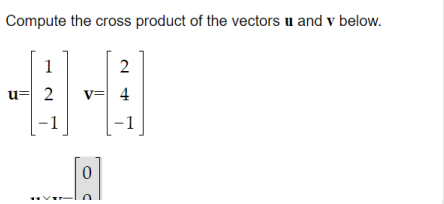
Up next for you in Algebra

Find the scalar equation for the plane passing through the point P=(−4, −3, −1) and containing t…



See answer

Compute the cross product of the vectors u and v below. u= 2 v= 4 uxv=



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Questions viewed by other students

The infinite series converges on a value of f(n)= pi^4/ 90 as n approaches infinity. Write to program in matlab single precision to calculate (n) for n=10,000 by computing the sum from i= 1 to 10,000. Then repeat the calculation but in reverse order that is from i= 10,000 to 1 using increments of-1. In each case, compute the true percent relative error. Explain the results. Problem...

See answer

The infinite series f(n) = sigma^n_k = 1 1/k^4 converges on a value f(n) = pi^4/90 as n approaches infinity. Write a program to calculate f(n) for n = 10,000 by computing the sum from k = 1 to 10,000. Then repeat the calculations but in reverse order that is, from k = 10,000 to 1 using increments of -1. In each case, compute the true percent relative error after each term is added...

See answer

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