



Core Mathematics C34(GCE)

Practice Answer 6

Standard A[★]

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**CRITICAL THINKING IS THE KEY TO SOLVE REAL WORLD PROBLEMS.
CHILDREN MUST BE TAUGHT HOW TO THINK, NOT WHAT TO THINK.
A GREAT TEACHER WILL BE CREATING STUDENTS TO DO NEW THINGS
THROUGH CRITICAL THINKING, NOT SIMPLY REPEATING WHAT OTHER
GENERATIONS HAVE DONE BEFORE. WE DO NOT NEED ANOTHER
ALBERT EINSTEIN OR ISAAC NEWTON.... WE NEED A PERSON BETTER
THAN THEM.**

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Answer:

Method 1

$$\frac{1}{\left(1-\frac{2}{3}x\right)} + \frac{1}{\left(1+\frac{2}{3}x\right)}$$

$$= \frac{1+\frac{2}{3}x+1-\frac{2}{3}x}{\left(1-\frac{2}{3}x\right)\left(1+\frac{2}{3}x\right)}$$

$$= \frac{2}{\left(1-\frac{4}{9}x^2\right)}$$

$$= 2\left(1-\frac{4}{9}x^2\right)^{-1}$$

$$= 2\left(1+\frac{4}{9}x^2+\frac{16}{81}x^4+\dots\right)$$

$$= 2+\frac{8}{9}x^2+\frac{32}{81}x^4$$

Answer:

Method 2

$$\frac{1}{\left(1 - \frac{2}{3}x\right)} + \frac{1}{\left(1 + \frac{2}{3}x\right)}$$

$$= \left(1 - \frac{2}{3}x\right)^{-1} + \left(1 + \frac{2}{3}x\right)^{-1}$$

$$= \left(1 + \frac{2}{3}x + \frac{4}{9}x^2 + \frac{8}{27}x^3 + \frac{16}{81}x^4\right) + \left(1 - \frac{2}{3}x + \frac{4}{9}x^2 - \frac{8}{27}x^3 + \frac{16}{81}x^4\right)$$

$$= 2 + \frac{8}{9}x^2 + \frac{32}{81}x^4$$

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Golden Rules

- $n! = n \times (n - 1) \times (n - 2) \times (n - 3) \times \dots \times 3 \times 2 \times 1$
- $\binom{n}{r} = \frac{n!}{(n-r)! \times r!}$
- $(1 + x)^n = 1 + nx + \frac{n(n-1)}{2!}x^2 + \frac{n(n-1)(n-2)}{3!}x^3 + \dots + \frac{n(n-1)\dots(n-r+1)}{r!}x^r + \dots$

where $|x| < 1$

Traditional or Online classes

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