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Universidad Técnica de Ambato
Facultad de Contabilidad y
Auditoría



DATOS INFORMATIVOS

Cattleya Guerra

Segundo semestre de Economía

Paralelo "A"

Fecha: 02/10/2024

~~Tema: Ejercicios sobre
función compuesta con
binomio de newton~~

Nº
12

COMPLETO



1

$$y = \sqrt[3]{x^2}$$

$$z = x+y$$

$$H: (zoy)$$

$$H: \sqrt[3]{(x+y)^2}$$

$$H: (n+y)^{2/3}$$

$$H = \binom{2/3}{0} x^{2/3-0} y^0 + \binom{2/3}{1} x^{2/3-1} y^1 + \binom{2/3}{2} x^{2/3-2} y^2 + \binom{2/3}{3} x^{2/3-3} y^3 + \dots + n$$

$$= 1x^{2/3} + \frac{2}{3}x^{-1/3}y - \frac{1}{9}x^{-4/3}y^2 + \frac{4}{81}x^{-7/3}y^3 + \dots + n$$

$$= \sqrt[3]{x^2} + \frac{2y}{3\sqrt[3]{x}} - \frac{1y^2}{9\sqrt[3]{x^4}} + \frac{4y^3}{81\sqrt[3]{x^7}} + \dots + n$$

$$= \sqrt[3]{x^2} + \frac{2y}{3\sqrt[3]{x}} \cdot \frac{\sqrt[3]{x^2}}{\sqrt[3]{x^2}} - \frac{y^2}{9\sqrt[3]{x^3}} \cdot \frac{\sqrt[3]{x^2}}{\sqrt[3]{x^2}} + \frac{4y^3}{81\sqrt[3]{x^3}} \cdot \frac{\sqrt[3]{x^2}}{\sqrt[3]{x^2}} + \dots + n$$

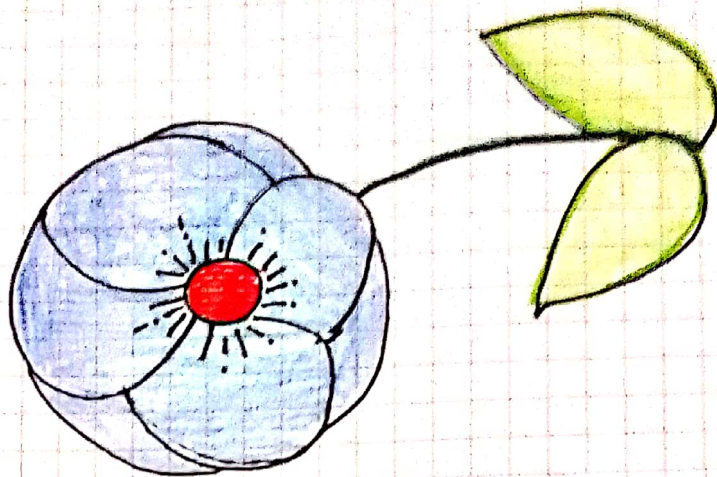
$$= \sqrt[3]{x^2} + \frac{2y\sqrt[3]{x^2}}{3\sqrt[3]{x^3}} - \frac{y^2}{9x\sqrt[3]{x}} + \frac{4y^3}{81x^2\sqrt[3]{x}} + \dots + n$$

$$= \sqrt[3]{x^2} + \frac{2y\sqrt[3]{x^2}}{3x} - \frac{y^2}{9x\sqrt[3]{x}} \cdot \frac{\sqrt[3]{x^2}}{\sqrt[3]{x^2}} + \frac{4y^3}{81x^2\sqrt[3]{x}} \cdot \frac{\sqrt[3]{x^2}}{\sqrt[3]{x^2}} + \dots + n$$

$$= \sqrt[3]{x^2} + \frac{2y\sqrt[3]{x^2}}{3x} - \frac{y^2\sqrt[3]{x^2}}{9x\sqrt[3]{x^3}} + \frac{4y^3\sqrt[3]{x^2}}{81x^2\sqrt[3]{x^3}} + \dots + n$$

$$= \sqrt[3]{x^2} + \frac{2y\sqrt[3]{x^2}}{3x} - \frac{y^2\sqrt[3]{x^2}}{9x^2} + \frac{4y^3\sqrt[3]{x^2}}{81x^3} + \dots + n$$

$$H: \sqrt[3]{x^2} \left(1 + \frac{2y}{3x} - \frac{y^2}{9x^2} + \frac{4y^3}{81x^3} \right)$$



2

$$y = \sqrt[3]{x^3}$$

$$H = (ZCY)$$

$$H = \sqrt[3]{(x+y)^3}$$

$$H = (x+y)^{3/8}$$

$$H = \left[\left(\frac{1}{8} \right)^{3/8-0} (x)^{3/8} + \left(\frac{3}{8} \right)^{3/8-1} (x)^{3/8-2} y + \left(\frac{3}{8} \right)^{3/8-2} (x)^{3/8-3} y^2 + \dots + n \right]$$

$$H = \left[(x)^{3/8} + \frac{3}{8} (x)^{-5/8} y - \frac{15}{128} (x)^{-13/8} y^2 + \frac{65}{1024} (x)^{-21/8} y^3 + \dots + n \right]$$

$$H = \left[\sqrt[8]{x^3} + \frac{3y}{8 \sqrt[8]{x^3}} - \frac{15y^2}{128 \sqrt[8]{x^{13}}} + \frac{65y^3}{1024 \sqrt[8]{x^{21}}} + \dots + n \right]$$

$$H = \left[\sqrt[8]{x^3} + \frac{3y}{8 \sqrt[8]{x^3}} - \frac{15y^2}{128 \sqrt[8]{x^{13}}} + \frac{65y^3}{1024 \sqrt[8]{x^{21}}} + \dots + n \right]$$

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$$H = \left[\sqrt[8]{x^3} + \frac{3y}{8 \sqrt[8]{x^3}} - \frac{15y^2}{128 \sqrt[8]{x^{13}}} + \frac{65y^3}{1024 \sqrt[8]{x^{21}}} + \dots + n \right]$$

(3)

$$y = \sqrt[3]{x^5}$$

$$H = (20y)$$

$$H = \sqrt[3]{(x+y)^5}$$

$$Z = x+y$$

$$H = (x+y)^{5/7}$$

$$H = \left[\binom{5/7}{0} (x)^{5/7-0} y^0 + \binom{5/7}{1} (x)^{5/7-1} y^1 + \binom{5/7}{2} (x)^{5/7-2} y^2 + \binom{5/7}{3} (x)^{5/7-3} y^3 + \dots + n \right]$$

$$H = \left[\binom{5/7}{0} (x)^{5/7} y^0 - \frac{5}{7} (x)^{5/7-1} y^1 + \frac{15}{343} (x)^{5/7-2} y^2 + \dots + n \right]$$

$$H = \left[\sqrt[7]{(x)^5} + \frac{5y}{7(x)^{6/7}} - \frac{5y^2}{49(x)^{11/7}} + \frac{15y^3}{343(x)^{16/7}} + \dots + n \right]$$

$$H = \left[\sqrt[7]{(x)^5} + \frac{5y}{7\sqrt[7]{(x)^6}} - \frac{5y^2}{49\sqrt[7]{(x)^{11}}} + \frac{15y^3}{343\sqrt[7]{(x)^{16}}} + \dots + n \right]$$

$$H = \left[\sqrt[7]{(x)^5} + \frac{5y}{7\sqrt[7]{(x)^6}} - \frac{5y^2}{49\sqrt[7]{(x)^{11}}} + \frac{15y^3}{343\sqrt[7]{(x)^{16}}} + \dots + n \right]$$

$$H = \left[\sqrt[7]{(x)^5} + \frac{5y^2\sqrt{(x)^5}}{7\sqrt[7]{(x)^{11}}} - \frac{5y^2}{49X\sqrt[7]{(x)^2}} + \frac{15y^3}{343X^2\sqrt[7]{(x)^4}} + \dots + n \right]$$

$$H = \left[\sqrt[7]{(x)^5} + \frac{5y\sqrt[7]{(x)^5}}{7X} - \frac{5y^2}{49X\sqrt[7]{(x)^2}} \cdot \frac{\sqrt[7]{(x)^5}}{\sqrt[7]{(x)^3}} + \frac{15y^3}{343X^2\sqrt[7]{(x)^4}} \cdot \frac{\sqrt[7]{(x)^3}}{\sqrt[7]{(x)^3}} + \dots + n \right]$$

$$H = \left[\sqrt[7]{(x)^5} + \frac{5y\sqrt[7]{(x)^5}}{7X} - \frac{5y^2\sqrt[7]{(x)^5}}{49X\sqrt[7]{(x)^7}} + \frac{15y^3\sqrt[7]{(x)^3}}{343X^2\sqrt[7]{(x)^7}} + \dots + n \right]$$

$$H = \left[\sqrt[7]{(x)^5} + \frac{5y\sqrt[7]{(x)^5}}{7X} - \frac{5y^2\sqrt[7]{(x)^5}}{49X^2} + \frac{15y^3\sqrt[7]{(x)^3}}{343X^3} + \dots + n \right]$$

$$y = \sqrt[8]{x^3}$$

$$H: (x+y)$$

$$Z = x+y$$

$$H: \sqrt[8]{(x+y)^3}$$

$$: (x+y)^{3/8}$$

$$H = \binom{3/8}{0} x^{3/8-0} y^0 + \binom{3/8}{1} x^{3/8-1} y^1 + \binom{3/8}{2} x^{3/8-2} y^2 + \binom{3/8}{3} x^{3/8-3} y^3 + \dots + n$$

$$= x^{3/8} + \frac{3}{8} x^{3/8-1} y - \frac{15}{128} x^{3/8-2} y^2 + \frac{65}{1024} x^{3/8-3} y^3 + \dots + n$$

$$= \sqrt[8]{x^3} + \frac{3y}{8\sqrt[8]{x^5}} - \frac{15y^2}{128\sqrt[8]{x^{13}}} + \frac{65y^3}{1024\sqrt[8]{x^{21}}} + \dots + n$$

$$= \sqrt[8]{x^3} + \frac{3y\sqrt[8]{x^3}}{8\sqrt[8]{x^8}} - \frac{15y^2\sqrt[8]{x^3}}{128\sqrt[8]{x^8}\sqrt[8]{x^8}} + \frac{65y^3\sqrt[8]{x^3}}{1024\sqrt[8]{x^8}\sqrt[8]{x^8}\sqrt[8]{x^8}} + \dots + n$$

$$= \sqrt[8]{x^3} + \frac{3y\sqrt[8]{x^3}}{8x} - \frac{15y^2\sqrt[8]{x^3}}{128x^2} + \frac{65y^3\sqrt[8]{x^3}}{1024x^3} + \dots + n$$

$$= \sqrt[8]{x^3} \left(1 + \frac{3y}{8x} - \frac{15y^2}{128x^2} + \frac{65y^3}{1024x^3} \right)$$

5

$$y = \sqrt{x}$$

$$H = (Z \circ y)$$

$$Z = x + y$$

$$H = \sqrt{(x+y)^2}$$

$$H = (x+y)^{1/2}$$

$$H = \left[\binom{1/2}{0} (x)^{1/2-0} y^0 + \binom{1/2}{1} (x)^{1/2-1} y^1 + \binom{1/2}{2} (x)^{1/2-2} y^2 + \dots + y^n \right]$$

$$H = \left[\frac{1}{2} \sqrt{x} + \frac{2y}{3(x)^{1/2}} - \frac{1}{2} \frac{y^2}{(x)^{3/2}} + \frac{4y^3}{81(x)^{5/2}} + \dots + y^n \right]$$

$$H = \left[\frac{1}{2} \sqrt{x} + \frac{2y}{3(x)^{1/2}} - \frac{1}{2} \frac{y^2}{(x)^{3/2}} + \frac{4y^3}{81(x)^{5/2}} + \dots + y^n \right]$$

$$H = \left[\frac{1}{2} \sqrt{x} + \frac{2y}{3(x)^{1/2}} - \frac{1}{2} \frac{y^2}{(x)^{3/2}} + \frac{4y^3}{81(x)^{5/2}} + \dots + y^n \right]$$

$$H = \left[\frac{1}{2} \sqrt{x} + \frac{2y}{3(x)^{1/2}} - \frac{1}{2} \frac{y^2}{(x)^{3/2}} + \frac{4y^3}{81(x)^{5/2}} + \dots + y^n \right]$$

$$H = \left[\frac{1}{2} \sqrt{x} + \frac{2y}{3(x)^{1/2}} - \frac{1}{2} \frac{y^2}{(x)^{3/2}} + \frac{4y^3}{81(x)^{5/2}} + \dots + y^n \right]$$

$$H = \left[\frac{1}{2} \sqrt{x} + \frac{2y}{3(x)^{1/2}} - \frac{1}{2} \frac{y^2}{(x)^{3/2}} + \frac{4y^3}{81(x)^{5/2}} + \dots + y^n \right]$$

$$H = \left[\frac{1}{2} \sqrt{x} + \frac{2y}{3(x)^{1/2}} - \frac{1}{2} \frac{y^2}{(x)^{3/2}} + \frac{4y^3}{81(x)^{5/2}} + \dots + y^n \right]$$

$$H = \left[\frac{1}{2} \sqrt{x} + \frac{2y}{3(x)^{1/2}} - \frac{1}{2} \frac{y^2}{(x)^{3/2}} + \frac{4y^3}{81(x)^{5/2}} + \dots + y^n \right]$$

$$H = 3\sqrt{x}^2 \left[1 + \frac{2y^3}{3x} - \frac{y^2}{9x^2} + \frac{4y^3}{81x^3} + \dots + y^n \right]$$

Los ejercicios me aportan mucho a mi carrera ya que me permiten describir y analizar una amplia variedad de fenómenos financieros.

Conclusión

Dominar la función compuesta con Binomio de Newton es una habilidad valiosa que me permite innovar, tomar decisiones basadas en datos y resolver problemas complejos.

Recomendación

Mi recomendación sería aprenderse bien las fórmulas y resolver más ejercicios para tener más práctica con cada uno de ellos.

