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17720_3
Word count: 0

2020-07-17

Calcolare il polinomio di Taylor di 3° ordine della funzione $f(x) = \sin(2x)$ nel punto $x = \pi/4$

$$\lim_{x \to 0} \sin(2x) = 2x - \frac{8x^3}{6} + o(x^3)$$

Non ha senso.

nel punto $x_0 = \frac{\pi}{2}$ vale $2\left(\frac{\pi}{2}\right) - \frac{8}{6}\left(\frac{\pi}{2}\right)^3 = \left(\pi - \frac{2}{3}\pi^3\right)$

voto 0

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es 3

Calcolare il polinomio di Taylor di ordine 3 della funzione $f(x) = \sin(2x)$ nel punto $x_0 = \frac{\pi}{4}$

$f(x) = \sin(2x) \;\downarrow\; f(x_0) = \sin\frac{\pi}{2} = 1$

$f'(x) = 2\cos(2x) \;\downarrow\; f'(x_0) = 2\cos\frac{\pi}{2} = 0$

$f''(x) = \overset{-4}{-2}\sin(2x) \;\downarrow\; f''(x_0) = -2\sin\frac{\pi}{2} = -2\cdot 1 = -2$

$f'''(x) = -2\cdot 2\cdot\cos(2x) = -4\cos(2x)$

$\downarrow$

$f(x_0) = -4\cdot\cos\frac{\pi}{2} = 0$

$$P_3(x) = f(x_0) + f'(x_0)(x-x_0) + \frac{f''(x_0)(x-x_0)^2}{2!} + \frac{f'''(x_0)(x-x_0)^3}{3!}$$

$$= 1 + 0 + \frac{(\cancel{-2})\cdot\left(x-\frac{\pi}{4}\right)^2}{\cancel{2}} + 0 = 1-\left(x-\frac{\pi}{4}\right)^2$$

Un errore di calcolo nella derivata seconda.

voto 3.7

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2020-07-17

17720_3
Word count: 0

CALCOLARE IL POLINOMIO DI TAYLOR DI ORDINE 3 DELLA FUNZIONE

$f(x) = \sin(2x)$ NEL PUNTO $x_0 = \frac{\pi}{4}$

$f^1(x) = 2\cos(2x)$

$f^2(x) = -4\sin(2x)$

$f^3(x) = -8\cos(2x)$

$$f\left(\frac{\pi}{4}\right) = \sin\left(\cancel{2}^{1} \cdot \frac{\pi}{\cancel{4}_{2}}\right) = 1$$

$$f^1\left(\frac{\pi}{4}\right) = 2\cos\left(\cancel{2}^{1} \cdot \frac{\pi}{\cancel{4}_{2}}\right) = 0$$

$$f^2\left(\frac{\pi}{4}\right) = -4\sin\left(\cancel{2}^{1} \cdot \frac{\pi}{\cancel{4}_{2}}\right) = -4$$

$$f^3\left(\frac{\pi}{4}\right) = -8\cos\left(\cancel{2}^{1} \cdot \frac{\pi}{\cancel{4}_{2}}\right) = 0$$

$$P_3(x) = 1 + 0 \cdot \left(x - \frac{\pi}{4}\right) - \frac{4}{2!}\left(x - \frac{\pi}{4}\right)^2 + \frac{0}{3!}\left(x - \frac{\pi}{4}\right)^3$$

$$= 1 - \frac{\cancel{4}^{2}}{\cancel{2}_{1}}\left(x^2 - \cancel{2}^{1} \cdot \frac{\pi}{\cancel{4}_{2}}x + \frac{\pi^2}{4^2}\right)$$

$$= 1 - 2x^2 + \pi x - \frac{\pi^2}{8}$$

$$P_3(x) = 1 - 2x^2 + \pi x - \frac{\pi^2}{8}$$

voto5

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17720_3
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$f(x) = \operatorname{sen} 2x$

$f'(x) = 2\cos x$

$f''(x) = 0$

$f'''(x) = 0$

$$P_n(x) = f(x_0) + f'(x_0)(x-x_0) + \frac{f''(x_0)}{2!}(x-x_0)^2 + \frac{f'''(x_0)}{3!}$$

$$P_3(x) = \operatorname{sen} \cancel{2} \cdot \frac{\pi}{\cancel{4}_{2}} + \cancel{2}\cos\frac{\pi}{\cancel{4}_{2}}\left(x - \frac{\pi}{4}\right) + \cancel{\frac{0}{2!}\left(x - \frac{\pi}{4}\right)^2} + \cancel{\frac{0}{3!}}$$

$P_3(x) = 1 + 0$

$P_3(x) = 1$

voto 0.5

Errori di calcolo molto gravi.
Molti errori non possono essere verificati perché
i calcoli non sono riportati.

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$f(0) = \sin(0)$ A cosa serve?

$f(0) = 0$

$f'(x) = \cancel{\cos 2x \cdot 2x + 2\sin 2x}\ \cos(2x) + \sin \cdot x$ NO

$f'(x_0) = \cos\left(\frac{2\pi}{4\,2}\right) + \sin\frac{\pi}{4}$

$f'(x_0) = 0 + \frac{1}{\sqrt{2}}$

Troppi errori.

$f'(x_0) = \frac{1}{\sqrt{2}}$

voto 0

$f''(x) = \cancel{\cos 2x}\ - \sin x + \cos x$

$f''(x_0) = -\sin\frac{\pi}{4} + \cos\frac{\pi}{4}$

$f''(x_0) = -\cancel{\frac{1}{\sqrt{2}}} + \cancel{\frac{1}{\sqrt{2}}}$

$f''(x_0) = 0$

$f'''(x) = -\cos x - \sin x$

$f'''(x_0) = -\cos\frac{\pi}{4} - \sin\frac{\pi}{4}$

$f'''(x_0) = -\frac{1}{\sqrt{2}} - \frac{1}{\sqrt{2}} = \frac{-1-1}{\sqrt{2}} = \frac{2}{\sqrt{2}}$

$P_n(x) = 0 + \frac{1}{\sqrt{2}}\left(x - \frac{\pi}{4}\right) + \frac{0}{2!}\left(x - \frac{\pi}{4}\right)^2 + \frac{\frac{2}{\sqrt{2}}}{3!}\left(x - \frac{\pi}{4}\right)^2$

$= +\frac{1}{\sqrt{2}}x - \frac{\pi}{4\sqrt{2}} + \frac{\frac{2}{\sqrt{2}}}{6}\left(x - \frac{\pi}{4}\right)^2$

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Word count: 0

2020-07-17

(3) CALCOLARE IL POLINOMIO DI TAYLOR DI ORDINE 3 DELLA FUNZIONE

$$f(x) = \sin(2x) \qquad x_0 = \frac{\pi}{4}$$

$$f' = \cos(2x)\cdot 2 = 2\cos(2x)$$

$$f'' = 2\cdot(-\sin(2x))\cdot 2 = -4\sin(2x)$$

$$f''' = -4\cos(2x)\cdot 2 = -8\cos(2x)$$

$$P_n(x) = \sin\left(\frac{\pi}{2}\right) + 2\cos\left(\frac{\pi}{2}\right)\cdot\left(x-\frac{\pi}{4}\right) + \frac{\left(-4\sin\left(\frac{\pi}{2}\right)\right)\left(x-\frac{\pi}{4}\right)^2}{2!} + \frac{\left(-8\cos\left(\frac{\pi}{2}\right)\right)\left(x+\frac{\pi}{4}\right)^3}{3!}$$

$$P_n = 1+2\cdot 0\cdot\left(x-\frac{\pi}{4}\right) + \frac{-4\left(x-\frac{\pi}{4}\right)^2}{2!} + \frac{0\cdot\left(x-\frac{\pi}{4}\right)^3}{3} = 1-2\left(x-\frac{\pi}{2}\right)^2$$

voto 5

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2020-07-17

17720_3
Word count: 0

$$\cancel{\operatorname{sen}(2x) = 2x - \left(\frac{2x-\frac{\pi}{4}}{3!}\right)^3 + o(x^3)}$$

$$f(x) = \operatorname{sen}(2x) = 2x - \left(\frac{2x-\frac{\pi}{4}}{3!}\right)^3 + o(x^3)$$

Completamente errato ed incomprensibile poiché non sono riportati i conti.

$\boxed{\text{voto 0}}$

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2020-07-17

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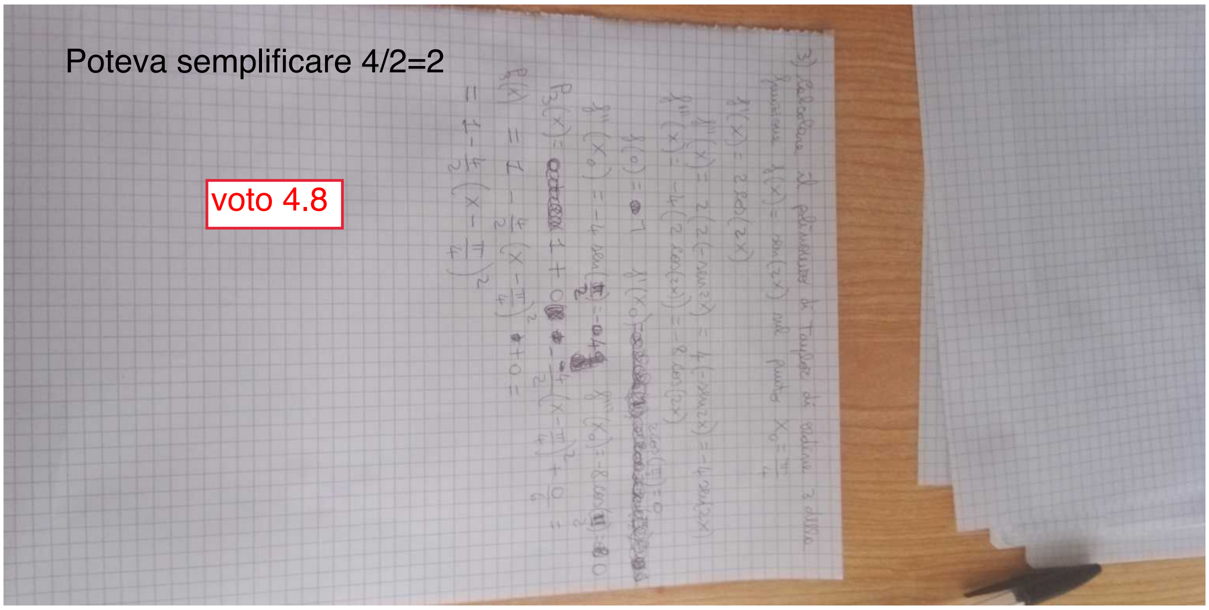
2020-07-17



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2020-07-17

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Word count: 0

$f(x) = \sin(2x)$ nel punto $x_0 = \frac{\pi}{4}$

$\cancel{P_n(x) = \cos(2x) +}$

$$P_n(x) = \frac{\pi}{4} + \frac{(-\cos(2x))\left(\frac{\pi}{4} + -\cos(2x)\right)^2}{2}$$

$$P_n(x) = \frac{\pi}{4} + \frac{(-\cos(2x))\cancel{\left(\frac{\pi}{4} - \cos(2x)\right)}\cancel{\left(-\frac{\pi}{4} + \cos(2x)\right)}}{2}$$

$$P_n(x) = \frac{\pi}{4} - \frac{\cos(2x)}{2}$$

Non è neanche un polinomio ...

voto 0

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2020-07-17

17720_3
Word count: 0

esercizio 3

calcolare il polinomio di taylor di ordine 3 della funzione $f(x) = sen(2x)$ nel punto $x_0 = \frac{\pi}{4}$

$$f''(x) = -2sen(2x) \cdot 2 = -4sen(2x)$$

$$f'(x) = cos(2x) \cdot 2 = 2cos(2x)$$

$$f'''(x) = -4cos(2x) \cdot 2 = -8cos(2x)$$

$$P_n(x) = f\left(\frac{\pi}{4}\right) + f'\left(\frac{\pi}{4}\right)\left(x-\frac{\pi}{4}\right) + \frac{f''\left(\frac{\pi}{4}\right)}{2!}\left(x-\frac{\pi}{4}\right)^2 + \frac{f'''\left(\frac{\pi}{4}\right)}{3!}\left(x-\frac{\pi}{4}\right)^3$$

Ha trascritto male la derivata seconda.

$$P_n(x) = \left(sen\left(2\cdot\frac{\pi}{4}\right)\right) + \left(cos\left(2\cdot\frac{\pi}{4}\right)2\right)\left(x-\frac{\pi}{4}\right) + \frac{\left(\overset{-4}{\cancel{-2}}sen\left(2\cdot\frac{\pi}{4}\right)\right)}{2!}\left(x-\frac{\pi}{4}\right)^2$$

$$+ \frac{\left(-4cos\left(2\cdot\frac{\pi}{4}\right)\right)}{3!}\left(x-\frac{\pi}{4}\right)^3 =$$

$$P_n(x) = 1 + 0\cancel{\left(x-\frac{\pi}{4}\right)} + \frac{(-2)^1}{2!}\left(x-\frac{\pi}{4}\right)^2 + \frac{(0)}{3!}\cancel{\left(x-\frac{\pi}{4}\right)^3} =$$

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

voto 4.3

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2020-07-17

17720_3
Word count: 0

CALCOLARE IL POLINOMIO DI TAYLOR DI ORDINE 3 DELLA FUNZIONE $f(x) = \sin(2x)$ $\quad x_0 = \frac{\pi}{4}$

$f(x) = \sin(2x)$

$f'(x) = 2\cos(2x) \qquad (f \cdot \varphi)' = f' \varphi + f \cdot \varphi'$

$f''(x) = \cos(2x) + 2 \cdot (-2\sin(2x)) =$

$= \cos(2x) - 4\sin(2x)$

$f'''(x) = -2\sin(2x) - \sin(2x) - 4 \cdot 2\cos(2x)$

$= -2\sin(2x) - \sin(2x) - 8\cos(2x)$

$P_N(x) = f(x_0) + f'(x_0)(x-x_0) + \frac{f''(x_0)}{2!}(x-x_0)^2 + \frac{f'''(x_0)}{3!}(x-x_0)^3 =$

$= \sin(2 \cdot 0) + 2\cos(2 \cdot 0)(x-0) + \frac{\cos(2 \cdot 0) - 4\sin(2 \cdot 0)}{2}(x-0)^2 -$

$- \frac{-2\sin(2 \cdot 0) - \sin(2 \cdot 0) - 8\cos(2 \cdot 0)}{6}(x-0)^3 =$

$= 0 + 2x - \frac{1}{2} + \frac{8}{6} =$

$= 0 + 2x - \frac{3+8}{6} = 0 + 2x - \frac{11}{6}$

Errori nelle derivate.

voto 1

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2020-07-17

17720_3
Word count: 0

$n=3 \qquad x_0 = \frac{\pi}{4}$

$f(x) = \sin(2x) \Rightarrow f(x_0) = \sin\left(\frac{\pi}{2}\right) = 1$

$f'(x) = 2\cos(2x) \Rightarrow f'(x_0) = 2\cos\left(\frac{\pi}{2}\right) = 0$

$f''(x) = -4\sin(2x) \Rightarrow f''(x_0) = -4\sin\left(\frac{\pi}{2}\right) = -4$

$f'''(x) = -8\cos(2x) \Rightarrow f'''(x_0) = -8\cos\left(\frac{\pi}{2}\right) = 0$

$P_n(x) = 1 + 0\left(x-\frac{\pi}{4}\right) - \frac{4}{2}\left(x-\frac{\pi}{4}\right)^2 + \frac{0}{6}\left(x-\frac{\pi}{4}\right)^3$

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

voto 5