§4.

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4.1. $\Delta f(1) = \Delta x + 3(\Delta x)^2 + (\Delta x)^3,$

$df(1) = \Delta x.$

a) $\Delta f(1) = 5 > df(1) = 1.$

b) $\Delta f(1) = 0{,}131 > df(1) = 0{,}1.$

c) $\Delta f(1) = 0{,}010301 > df(1) = 0{,}01.$

4.2. $dy = -\dfrac{2}{x^3} dx.$

4.3. $dy = -\dfrac{3}{(x-1)^2} dx.$

4.4. $dy = (\sin 2x) dx.$

4.5. $dy = \dfrac{2\sqrt{x} - \sin\left(2\sqrt{x}\right)}{4x\sqrt{x}\cos^2\sqrt{x}} dx.$

4.6. $-\tan^2 x \qquad \left(x \neq k\dfrac{\pi}{2}, k \in \mathbb{Z} \right).$

4.7. $y = ax + b \Rightarrow y' = a$ và $dy = a dx = a\Delta x$;

$\Delta y = a(x + \Delta x) + b - [ax + b] = a\Delta x.$

Vậy $dy = \Delta y.$

4.8. Đặt $y(x) = \sqrt{a^2 + x}$, ta có $y'(x) = \dfrac{1}{2\sqrt{a^2 + x}}.$

Từ đó

$$\Delta y = y(x) - y(0) \approx y'(0)\, x \Rightarrow \sqrt{a^2 + x} \approx a + \dfrac{1}{2a}x.$$

Áp dụng :

a) 12,08 ; b) 5,83 ; c) 10,95.

4.9. $\tan 44^\circ 52' \approx 0{,}9954$.