16a:

$t_{(x)} = x\cos x$

$dt_{(x)} = (\cos x - x\sin x)dx$

$d^2t_{(x)} = (-\sin x - (\sin x - x\cos x))(dx)^2$

$d^2t_{(x)} = (-2\sin x - x\cos x)(dx)^2$

b:

$t_{(x,y)} = (x + y^3)^2 = x^2 + 2xy^3 + y^6$

I.diferenciál :

$dt_{(x,y)} = \dfrac{\partial t}{\partial x}dx + \dfrac{\partial t}{\partial y}dy = (2x + 2y^3)dx + (6xy^2 + 6y^5)dy$

II.diferenciál :

$d^2t_{(x,y)} = \dfrac{\partial^2 t}{\partial x^2}(dx)^2 + 2\dfrac{\partial^2 t}{\partial x\partial y}dxdy + \dfrac{\partial^2 t}{\partial y^2}(dy)^2$

$d^2t_{(x,y)} = (2)(dx)^2 + 12dxdy + (12xy + 30y^4)(dy)^4$

17:

a:

$\sqrt{3,98}$

$f_{(x)} = \sqrt{x}$

$a = 4$

$f_{(a)} = 2$

$f'_{(x)} = \dfrac{1}{2\sqrt{x}}$

$f'_{(a)} = \dfrac{1}{2\sqrt{4}} = \dfrac{1}{4}$

$\sqrt{3,98} \doteq \sqrt{4} + \dfrac{1}{4}\left(-0,02\right) \doteq 1,995$

$\sqrt{3,98} = 1,9949937\ldots$

b:

$\left(\dfrac{3,96}{2,01}\right)^3 = \dfrac{3,96^3}{2,01^3}$

$f_{(x)} = g_{(x)} = x^3$

$a = 4$

$f_{(a)} = 64$

$f'_{(x)} = 3x^2$

$f'_{(a)} = 48$

$3,96^3 \doteq 64 - 48 \cdot \left(0,04\right) = 62,08$

$b = 2$

$g_{(b)} = 8$

$g'_{(b)} = 3x^2$

$g'_{(b)} = 12$

$2,01 \doteq 8 + 12 \cdot 0,01 = 8,12$

$\left(\dfrac{3,96}{2,01}\right)^3 \doteq \dfrac{62,08}{8,12} = 7,645$

$\left(\dfrac{3,96}{2,01}\right)^3 = 7,64711085$