

**Quiz Math101    26.11.2007**

<b>Name</b>
<b>Stud ID</b>

1) True or False? **You MUST justify your answer. If False, write the correct solution !!!**

a)  $\frac{d}{dx}(3^x) = x3^{x-1}$   T  F

b) An equation of the tangent line to the parabola  $y = (x - 1)^2$  at  $Q(-1, 4)$  is  $y + 4x = 0$ .  T  F

c) If  $y = e^2$ , then  $y' = 2e$ .  T  F

2) Compute  $y'$  for  $y = \sinh(\tan \sqrt{1 + x^3})$ .

**Solution:**

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- 3) a) Sketch the graph of the curve  $x^2y^2 + xy = 2$ .
- b) Find all points on the curve  $x^2y^2 + xy = 2$  where the slope of the tangent is  $-1$ .
- c) Look at the graph of the curve, and determine which points found at b) have the property that  $y''(x) > 0$ .
- d) Compute  $y''(x)$  at the point(s) found at c).

**Solution:**

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4) Prove by induction that  $\frac{d^n}{dx^n}(\sin^4 x + \cos^4 x) = 4^{n-1} \cos(4x + n\pi/2)$  for all  $n \geq 1$ .

**Solution:**