

Given the relation: $e^{xy} = x^2 + y^2$

Find the equation of the tangent line to the curve at the point (2, 0.75).

$$\begin{aligned}\frac{d}{dx}(e^{xy} = x^2 + y^2) &= e^{xy}(xy' + y) = 2x + 2yy' \\ e^{1.5} (2y' + 0.75) &= 4 + 1.5y' & 4.481(2y' + 0.75) &= 4 + 1.5y' \\ 8.963y' + 3.361 &= 4 + 1.5y' & 7.463y' &= 0.639 \\ y' &= 0.0855\end{aligned}$$

answer: $y - 0.75 = 0.0855(x - 2)$

Calculate $g(b)$ and $g'(b)$, where $g(x) = f^{-1}(x)$.

$$f(x) = 2^x + 3^x \quad b = 13$$

$$2^x + 3^x = 13$$

$$x = 2$$

$$f(2) = 13$$

$$g(13) = 2$$

$$g(b) = \underline{2}$$

$$g'(13) = \frac{1}{f'(2)}$$

$$f'(x) = 2^x \ln 2 + 3^x \ln 3$$

$$f'(2) = 4 \ln 2 + 9 \ln 3 = 12.660$$

$$g'(13) = \frac{1}{12.660} = 0.0789$$

$$g'(b) = \underline{0.0789}$$