

Implicit Differentiation
(Supplemental Problems)

① $\sin(x^2 y^2) = x$ Find y'

Answer:
$$\frac{1 - 2xy^2 \cos(x^2 y^2)}{2x^2 y \cos(x^2 y^2)}$$

② $\tan^3(xy^2 + y) = x$ Find y'

Answer:
$$\frac{1 - 3y^2 \tan^2(xy^2 + y) \sec^2(xy^2 + y)}{3(2xy + 1) \tan^2(xy^2 + y) \sec^2(xy^2 + y)}$$

③ $2(x^2 + y^2)^2 = 25(x^2 - y^2)$ find y' at $(3, 1)$.

Answer: $-\frac{9}{13}$

④ This one is worked out on the other page:
Find y' if $\sqrt{1 + \sin^3(xy^2)} = y$

Answer:
$$\frac{3y^2 \sin^2(xy^2) \cos(xy^2)}{2\sqrt{1 + \sin^3(xy^2)} - 6xy \sin^2(xy^2) \cos(xy^2)}$$

Hint: Use the "A" technique on these problems as discussed in class.