MTH 133			Quiz 12		December 4, 2018
Name: Clear your des If you have a c	Sold sk of everything ex question raise you	tion xcept pens, penci r hand and I will	lls and eraser come to you	_ Section: rs. Show all your work u.	. 11
1. (5 points) (Recall th	Find the length of $L = \int_a^b \sqrt{1 + [.]}$	of the curve given $\overline{f'(x)]^2}dx$	h by $y = \frac{4\sqrt{2}}{3}$	$x^{3/2} - 1$ for $0 \le x \le 1$	
f'(x)	$= \frac{4\sqrt{2}}{3}, \frac{3}{2}$ .	$\chi^{\frac{1}{2}} = 2\sqrt{2}$	2. 1×	$L = \int \sqrt{l+8}$	sx dx
(f'(x))	$)^{2} = 2^{2} \cdot 2^{2}$	$2 \cdot X = 87$	X.۰	Let $u = 1 + 8 \chi$ ,	$\frac{du}{8} = dx$
$L = \int_{N}^{9} N$	$u \frac{du}{8} = \frac{1}{8}$	$\int u^{V_2} du =$	$\frac{1}{8} \frac{u^{3/2}}{3}$	$\frac{9}{3} = \frac{2}{3} \cdot \frac{1}{8} \cdot U_{V}$	ŭ
Ĩ	-	= 7	$\frac{1}{2}$ (979.	$-1\cdot\sqrt{1} = \frac{1}{12} \left(27\right)$	$(-1) = \frac{26}{12}$

2. (5 points) Find the equation in x and y for the line tangent to the curve given parametrically by  $x = 10 \sin 2t$ ,  $y = 10 \cos 2t$ 

at the point on the curve associated with  $t = \frac{\pi}{8}$ .

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$$\frac{dx}{dt} = 20 (\omega(2t)), \quad \frac{dy}{dt} = -20 \operatorname{Sin}(2t).$$

$$\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}} = -t \operatorname{an}(2t).$$

$$m = \frac{dy}{dx} \Big|_{t=\frac{\pi}{8}} = -t \operatorname{an}(\frac{\pi}{4}) = -1.$$

$$X(\overline{w}_{8}) = 10 \operatorname{Sin}(\frac{\pi}{4}) = 5\sqrt{2}, \quad y(\overline{w}_{8}) = 10 \operatorname{cos}(\overline{w}_{4}) = 5\sqrt{2}.$$
Eqn of tangent line:  $y - 5\sqrt{2} = -(\chi - 5\sqrt{2})$