12. $f(x) = \frac{-1}{\sqrt[5]{x^3}}$ $(1, -1)$ (x, y)

FIND EQUATION OF TANGENT LINE

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① FIND DERIVATIVE

$f(x) = \frac{-1}{x^{\frac{3}{5}}}$

$f(x) = -1x^{-\frac{3}{5}}$

$f'(x) = -1\left(-\frac{3}{5}x^{-\frac{3}{5}-1}\right)$

$= \frac{3}{5}x^{-\frac{8}{5}}$

$f'(x) = \frac{3}{5x^{8/5}}$

② PLUG IN X PART OF POINT AND CHANGE $f'(x)$ TO m

$m = \frac{3}{5(1)^{8/5}}$

$m = \frac{3}{5}$

③ PLUG IN m FROM STEP ② AND GIVEN POINT FOR x, y INTO $y = mx + b$ AND SOLVE FOR b

$y = mx + b$

$-1 = \frac{3}{5}(1) + b$

$-1 = \frac{3}{5} + b$

$-1 - \frac{3}{5} = b$

$-\frac{8}{5} = b$

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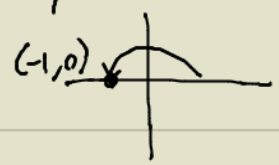
13. $f(x) = \cos x + \frac{1}{3}e^x$ $(\pi, -1 + \frac{1}{3}e^\pi)$ (x, y)



① $f'(x) = -\sin x + \frac{1}{3}e^x$

② $m = -\sin\pi + \frac{1}{3}e^\pi$

$m = -0 + \frac{1}{3}e^\pi$

$m = \frac{1}{3}e^\pi$

③ $y = mx + b$

$-1 + \frac{1}{3}e^\pi = \frac{1}{3}e^\pi(\pi) + b$

$-1 + \frac{1}{3}e^\pi = \frac{1}{3}\pi e^\pi + b$

$-1 + \frac{1}{3}e^\pi - \frac{1}{3}\pi e^\pi = b$

$-\frac{3}{3} + \frac{e^\pi}{3} - \frac{\pi e^\pi}{3} = b$

$b = \frac{e^\pi - \pi e^\pi - 3}{3}$

④ WRITE ANSWER

$y = mx + b$

$y = \frac{3}{5}x - \frac{8}{5}$

④ $y = mx + b$

$y = \frac{e^\pi}{3}x + \frac{e^\pi - \pi e^\pi - 3}{3}$