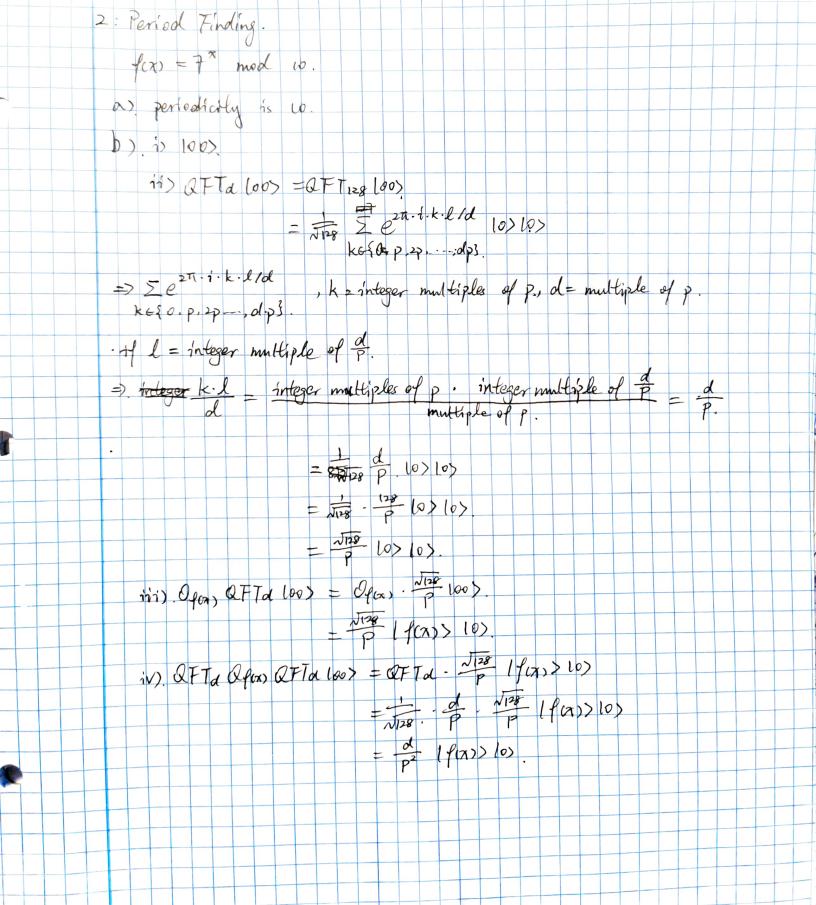
Assignment 2 1: Magic states & T-gates. a) (NOT (\$) = (NOT (\$\alpha 10) + \beta 10). - (10x01 @7 + [1x1(@x) (010>+Blis) = x 10x010> + Blox011> +x 1x1(0> 8x, +Blix1)1>0x. = xlo> + B11>0x $(407) = (407) = (40) + e^{i\frac{\pi}{4}} (10)$ $e^{i\frac{\pi}{4}} = (40) + e^{i\frac{\pi}{4}} = (40) +$ - 立 (10×0(8)+ 1×1(8×)(0+10)+ 元(1+1) =元(1+1) = = [(0x010> + 11x(11> = (1+i) -x] = 1/2 (0) + 1/2 (1+1) 11> 07 b) $P_{10} = |\pm|^2 = \pm$ $P_{11} = |\pm|(1+i)|^2 = \pm(1+2i+i^2) = \pm i$ c) $T(\beta) = \begin{bmatrix} 1 & 0 \\ 0 & e^{i\frac{\pi}{B}} \end{bmatrix} \begin{pmatrix} \alpha \\ \beta \end{pmatrix} = \begin{pmatrix} \alpha \\ e^{i\frac{\pi}{B}} \beta \end{pmatrix} = \alpha(0) + e^{i\frac{\pi}{B}} \beta(1)$ e = cos 8 + 1 sin 8 $\beta = 0$, $\Rightarrow \alpha lo >$ d) $T(\emptyset) = \begin{bmatrix} 1 & 0 \\ 0 & e^{i\frac{\pi}{2}} \end{bmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{bmatrix} x \\ e^{i\frac{\pi}{2}} \end{pmatrix} = x(0) + e^{i\frac{\pi}{2}} y(0)$



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