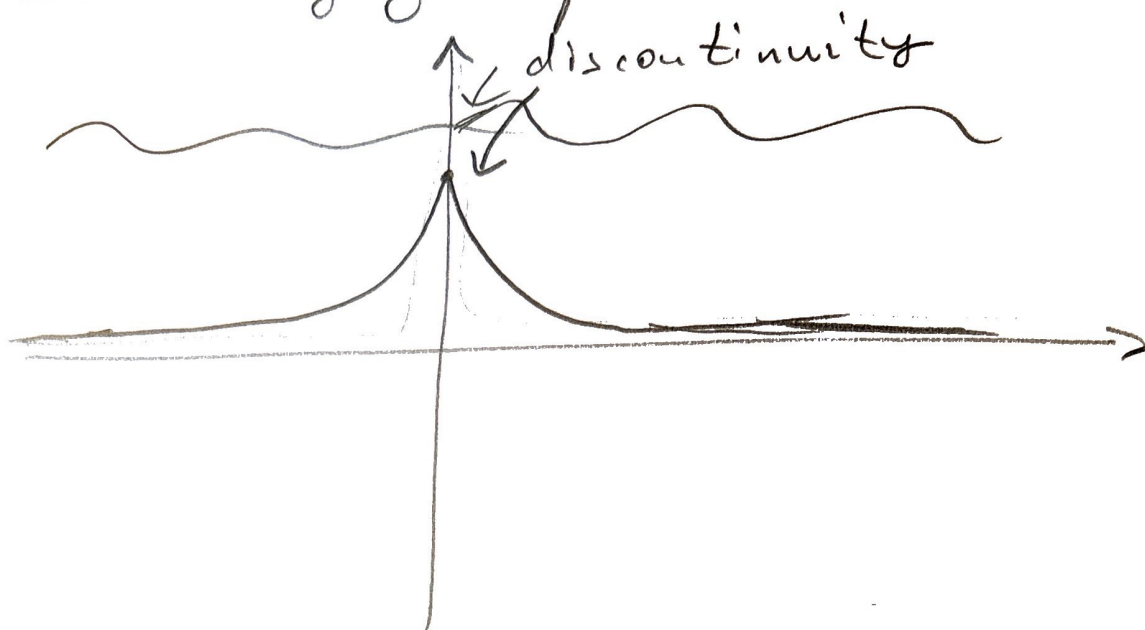
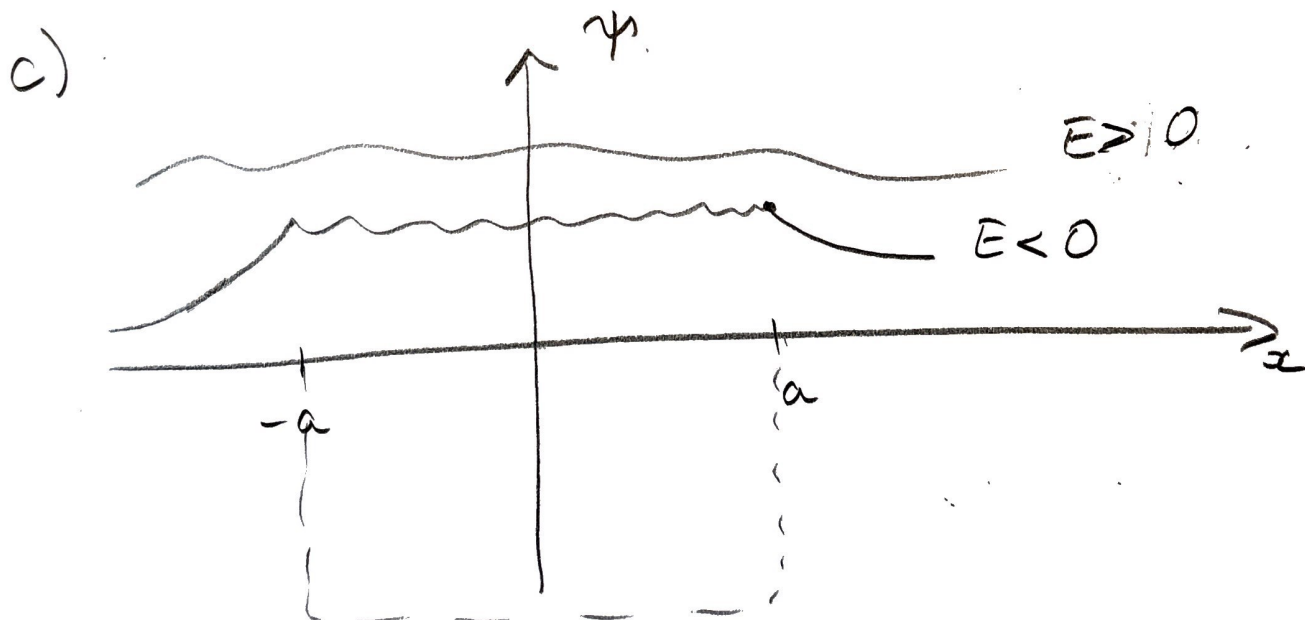


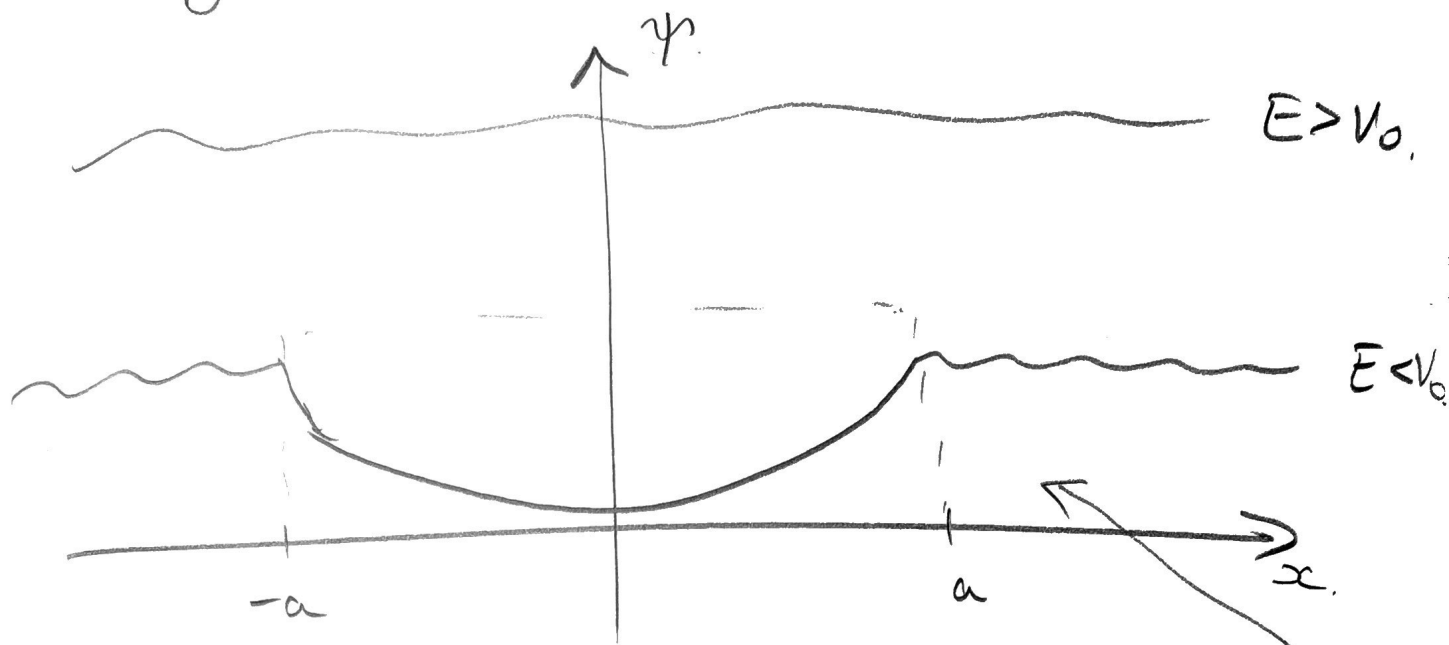
1 a) Solutions are plane waves (unbound states w/ $E > 0$) and decaying exponentials ($E < 0$).



b) $\pm \alpha \delta(x) \Rightarrow$ only 1 bound state $E < 0$; many w/ $E > 0$.



d) need $E > V_0$ if $V_0 < 0$ and $E > 0$ if $V_0 > 0$.



e) Tunneling is the phenomenon where a quantum particle has a nonzero probability to pass through a classically forbidden region. (E.g.) So for the finite square barrier ($V_0 > 0$), a particle approaching from $x \rightarrow -\infty$ w/ $E < V_0$ has nonzero probability to pass through the barrier and be found at $x > a$. Same for δ -function barrier — it can be found at $x > 0$.