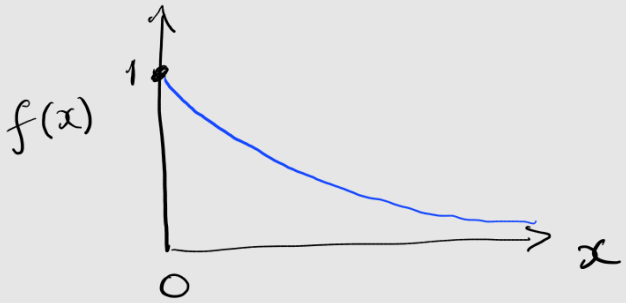
How to sketch graphs

To sketch graphs, think like a cartoonist an show all the important features

some examples

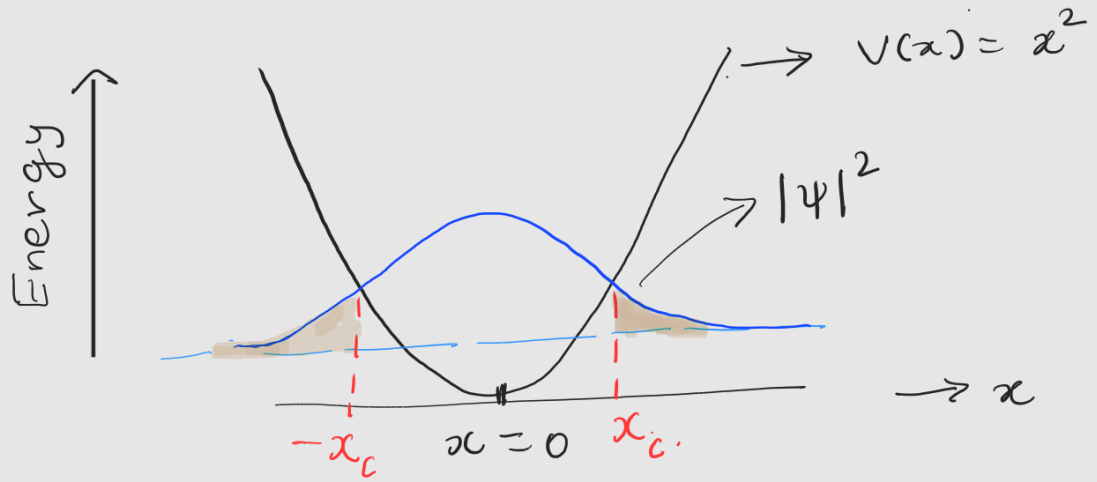
1 Sketching an exponential function e^{-x}



Two features to note:

- Behaviour near x=0 is linear. Slope and value of function at x=0 to be noted.
- Behaviour as $x \to \infty$.

2 Ground state of harmonic oscillator on top of oscillator potential $V(x)$

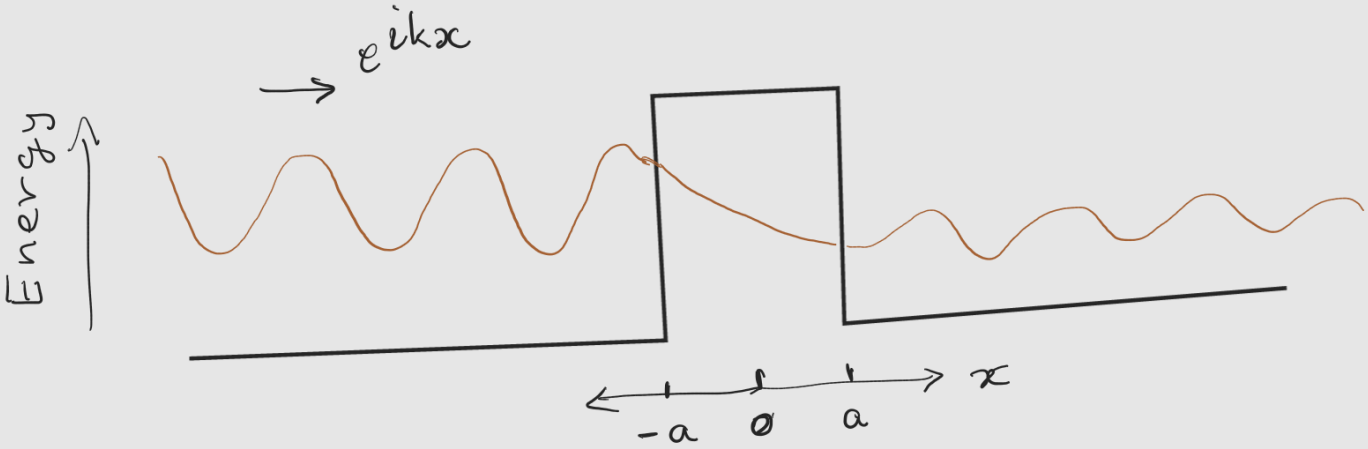


Features to note

- Large spillover of $|\psi|^2$ outside the classically turning points $x > x_c$ and $x < -x_c$ (shaded in light brown).

$x_c \to$ classical turning point

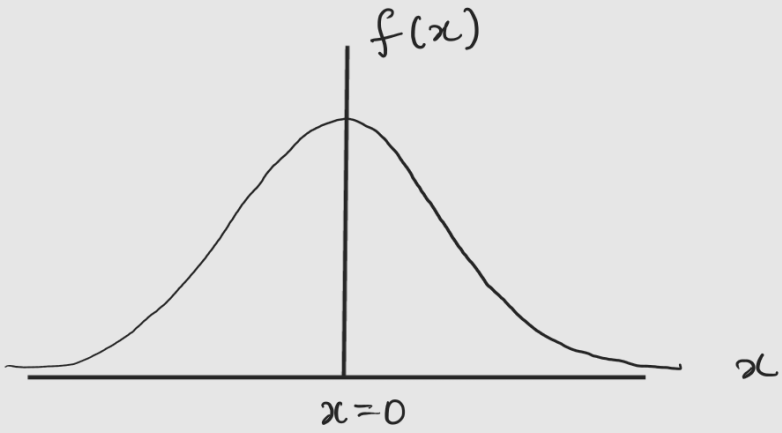
3 Tunnelling behaviour through a potential barrier



Features to note

- Decay inside the barrier region $-a < x < a$.
- Note the different wavelengths on left and right side of the barrier

4 A Gaussian function $f(x) = e^{-x^2}$



Features to note

- Slope at x=0 should be 0.
- Should be symmetric about x=0

More examples will be added.