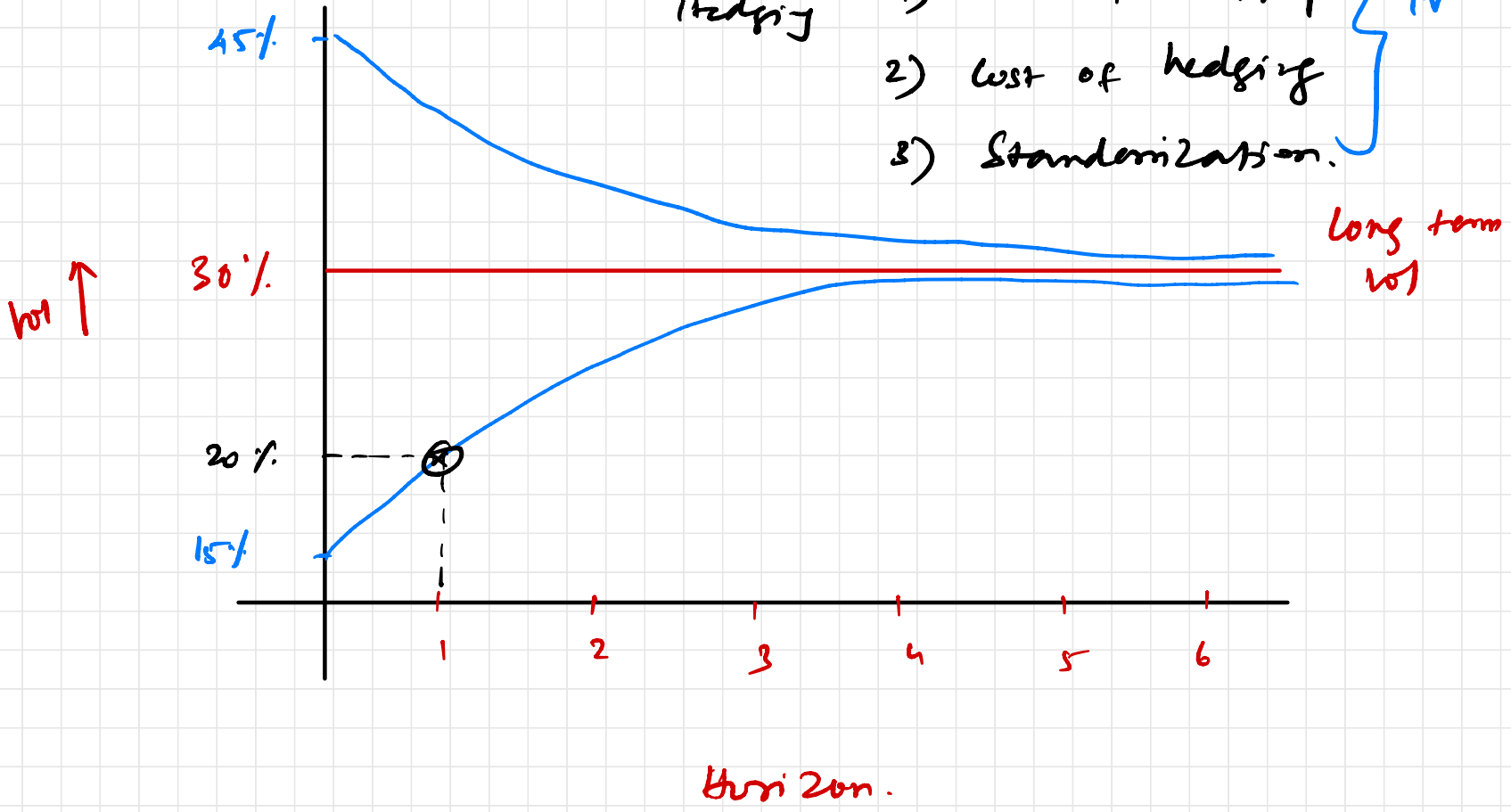
Cost of option $\propto$ Vol $\simeq$ cost of hedging

1) demand - supply
2) cost of hedging
3) Standardization.

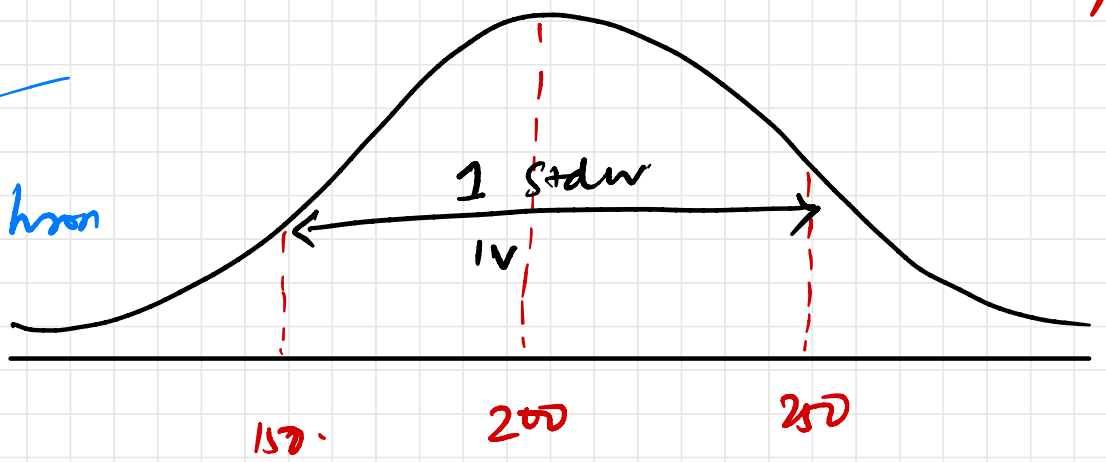
} IV



Implied vol

1. Newton-Raphson
2. Bi-section

25% ann.



standardize = 1stdev = IV

How do we formulate IV?

$$\theta + \frac{1}{2}\sigma^2 S^2 \Gamma + rS\Delta - rV = 0$$

$$C = S N(d_1) - K e^{-rt} N(d_2)$$

$$= S N(d_1(\sigma)) - K e^{-rt} N(d_2(\sigma))$$

$$C = S N(d_1(\sigma)) - K e^{-rt} N(d_2(\sigma))$$

$$f(\sigma) = f(\sigma) = \underbrace{S N(d_1) - K e^{-rt} N(d_2)}_{\text{B.S price}} - \underbrace{C}_{\text{Mkt price}}$$

Root finding Exercise

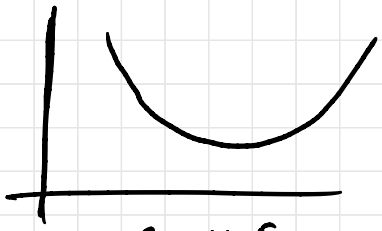
Newton

1) Initial Guess
2) Derivative
3) Rate of Conv. is Quadratic

IV skew

Equity

Index



Forex

Comdty