(1) Options → It is an agreement between two parties to buy or sell an asset at a predetermined future date for a specific price and here the buyer is not obliged to excerice their agreement to buy or sell.

Types of options:

(i) Call options
↓
It gives the holder the right to buy the underlying asset at the strike price

(ii) Put option
↓
It gives the holder the right to sell the underlying asset at strike price.

Key differences from futures and equity :—

(i) options provide the right but not the obligation to buy or sell but in future both parties are obliged to fullfill the terms of contract.

(ii) In option buying, maximum potential loss is equal to premium paid whereas in equity unlimited loses can happen if stock declines. and also same can happen in futures also.

(iii) Options have limited lifespan whereas in equity, it represents ownership in a company and can be held indefinitely.

(iv) Option gives more flexibility compare to futures and equity.

(2) There are many factors which affect the premium of option prices. first lets think of an example of a ship sailing in the sea. The speed at which the ship sails (assume speed = premium) depend on various forces such as wind speed, sea water density, sea pressure and power of the ship. Some forces tend to increase the speed while some tend to decrease. The ship battles these forces and finally arrives at an optimal sailing speed. Likewise the premium of option depends on certain forces called as the 'option Greeks'. Some option greeks tend to increase the ~~option~~ premium while some try to reduce mainly, option with longer expiration periods have high premium because they offer more time for the underlying asset to move in a favorable direction.

(3) Case-1 :

Strike price = 13000
spot price is infinity
By the use of long ITM call option trader can buy the stock at 13000 and sell it at an infinitely higher price

Case-2 :

Strike price = 15000
spot price is infinity
Here also trader can buy the stock at 15000 and sell it at an infinitely higher price but one things can be noted is that the profit is lower than the case I.

Case-3 :

Strike price = 14000
Spot price is Infinity.
Here, trader will go in loss because ~~trader~~ the ~~holder~~ buyer of call option would exercise them and trader have to sell the stock at 14000, which is much lower than the spot price.

(4) Strike price = 1000

(a) spot price = 700

Intrinsic value (IV) = spot price - strike price

(for call option) = 700 - 1000

= -300

But IV is never negative so, IV = 0.

Profit & Loss = Max [0, (spot price - strike price)] - premium paid

= 0 - premium paid

P&L = - premium paid

IV for put option = strike price - spot price

= 1000 - 700

Profit & loss (P&L) = [max (0, [1000-700)] - Premium paid

= 300 - premium paid.

(b) spot price = 1100

P&L (call) = max [0, (1100-1000)] - premium paid

= 100 - premium paid

P&L (Put) = Max [0, (1000-1100)] - premium paid

= 0 - premium paid = - premium paid.

(5) Strike price = a, b, c
premium = x, y, z

Strike price of $b = \frac{a+c}{2} \Rightarrow a = 2b - c$
$c = 2b - a$

Since we know in general the premium tends to decrease as the strike price increases, so y is expected to be less than the average of x and z

(6) premium = 5 $
strike price = 100 $

(a) stock price = 90 $

IV = stock price - strike price
= 90 - 100 = -10
= 0 (Never -ve)

strike price > stock price
⇒ OTM

Time value = Premium - IV
= 5 $

(b) stock price = 105 $

IV = 105 - 100 = 5 $
Time value = 5 - 5 = 0
stock price > strike price
⇒ ITM

potential

Here the max^m loss can be unlimited in case of selling options. Margin requirement for selling a naked call option is usually based on potential loss.