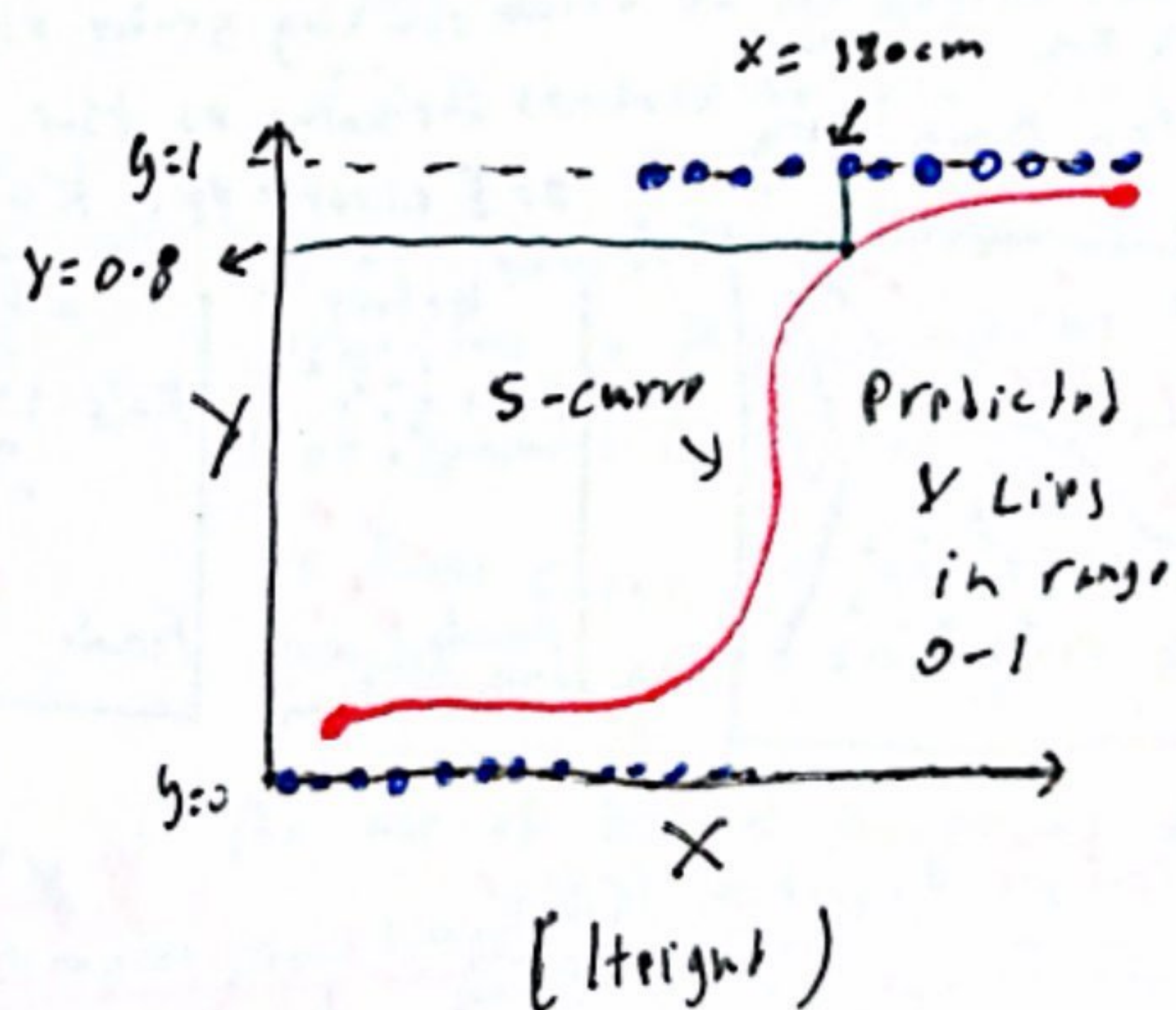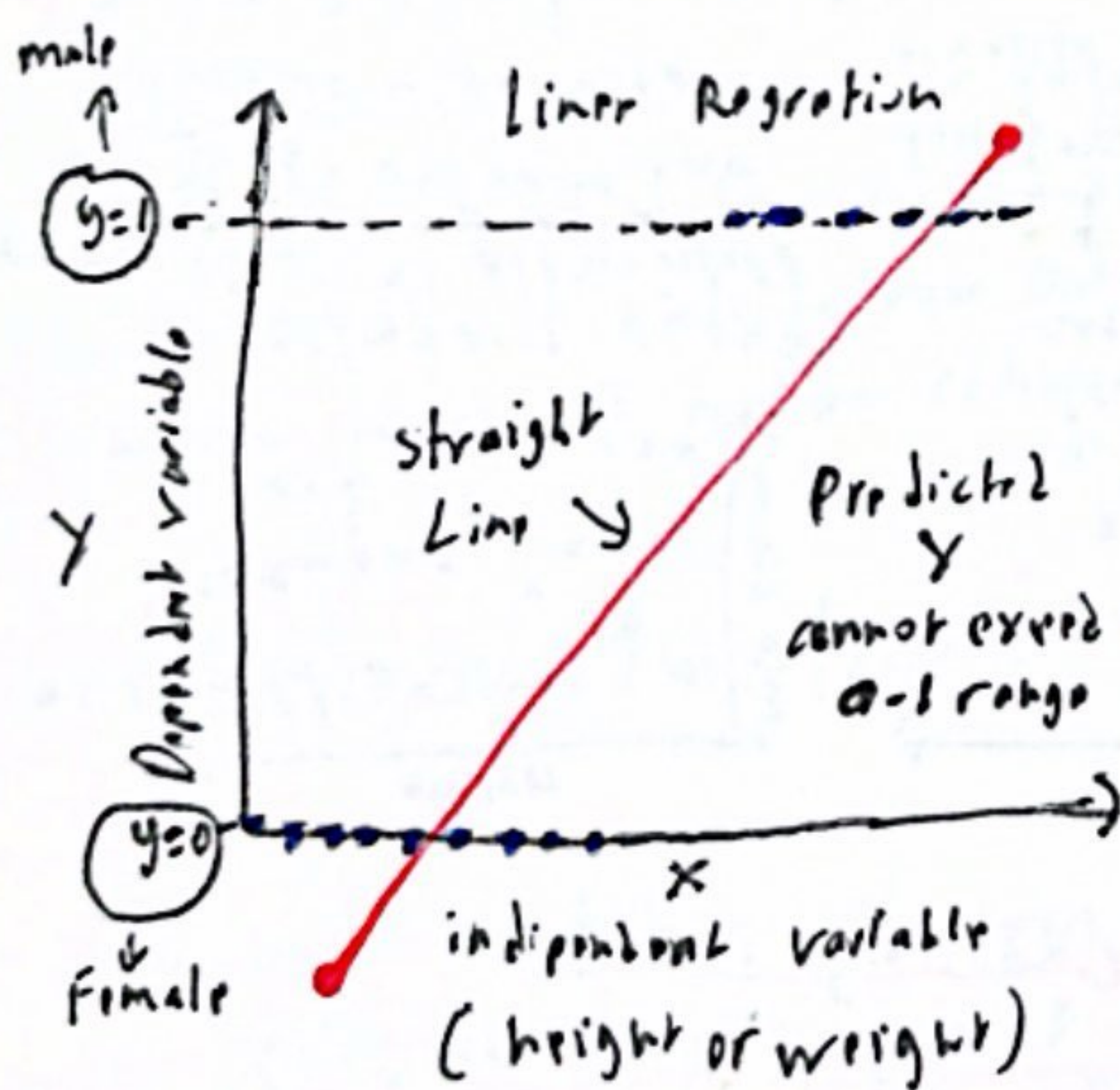# Logistic Regression (- supervised learning / - Classification)

1 — is a varient of linear regretion and is a
Classification algorithm. insted of fitting a line
to 2 vars, with a linear relationship, we now predict
a catigorical output variable using catigorical or numerical
input variables.

2 ☆ Ex lets say we want to predict one of 2 classes for
Ex the gender of a person based on height or weight for ex
a liner regretion dose not make sense as this is classificaton problem
i. now insted of a line we fit a sigmed curve to the data
The equation will not tell us about a liner relationship between 2 vars
but will tell us the probibility of a data point falling into a
certial class given value of in put variable.

male
↑
(y=1) ---- Liner Regretion
Y (Dependent variable)
straight
Line ↘   Predicted
           Y
           cannot exced
           0-1 range
(y=0) ••••••••••••••
      x
↓   indipendent variable
Female (height or weight)

X = 180cm
y=1 ↗ ------ ••••• ••○○○○○
y=0.8 ←
Y   S-curve   Predicted
           ↘   Y Lirs
                     in range
                     0-1
y=0 ••••••••••••••
         X
      [Height)

5
☆ sigmoid
function

$$S(x) = \frac{1}{1 + e^{-x}}$$

6 ☆ Ex the Liklyhood of a person with height 180cm
being a man is 80%

7 ☆ This task is imposibly with a strait line (linear)
as the probability disterbution would require the
line to bend and curve to mach the probolity distrobution
otherwise X is not accurate

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