Graphs of functions ①

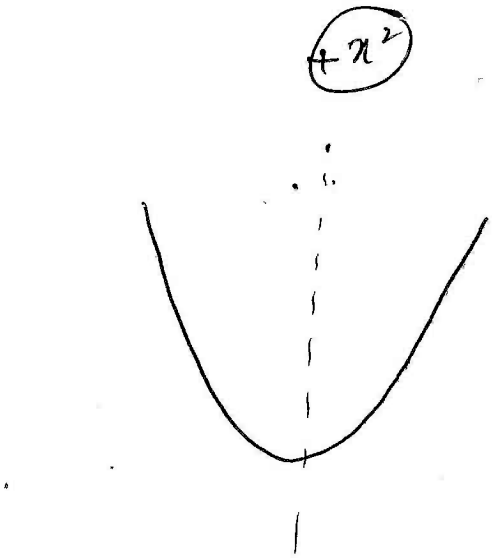
17-10-2018

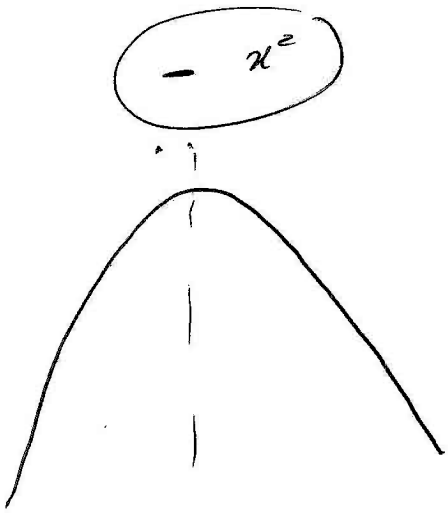
$f(x) = y$

Parabola

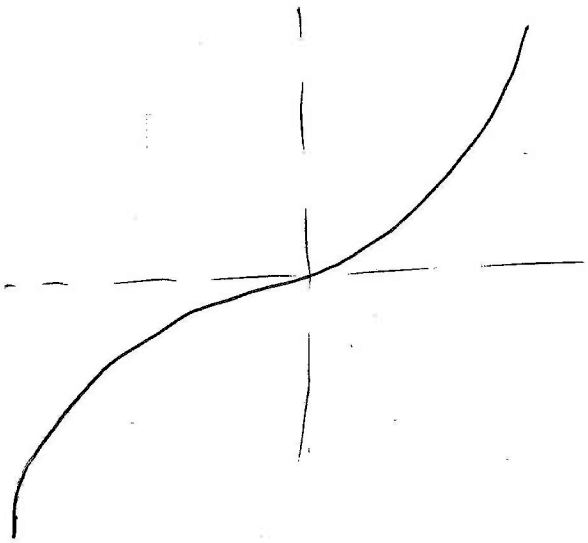
① $y = x^2$

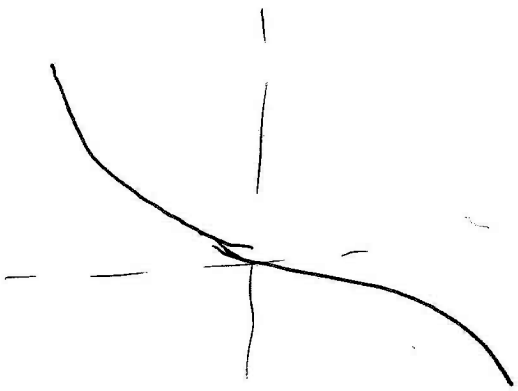
Quadratic function.





② $y = x^3$

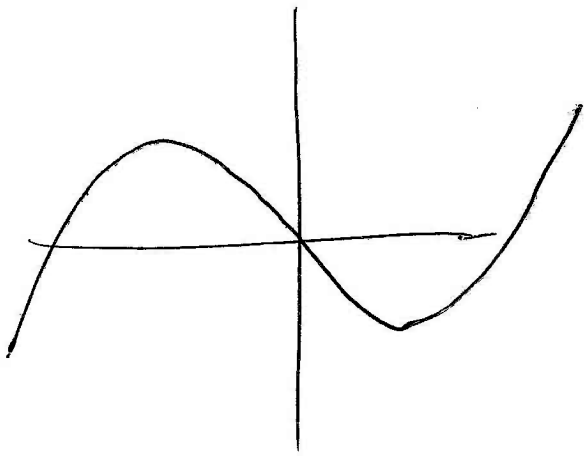




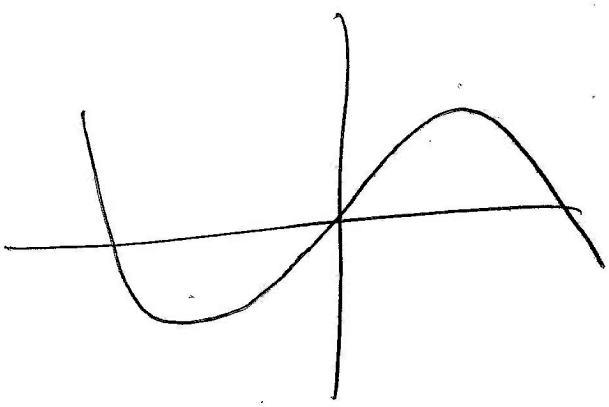
(ii)

$$y = ax^3 + bx^2 + cx + c$$

$+ax^3 - - -$



$-ax^3 + - - -$

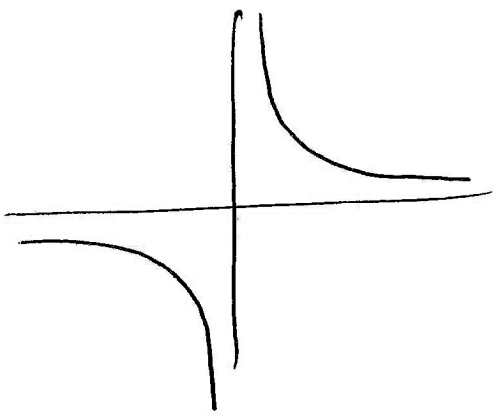


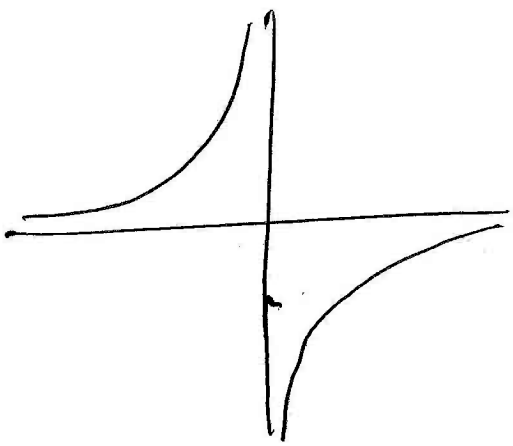
(3) $\boxed{y = \frac{1}{x}}$

Demand graph

$y = -\frac{1}{x}$

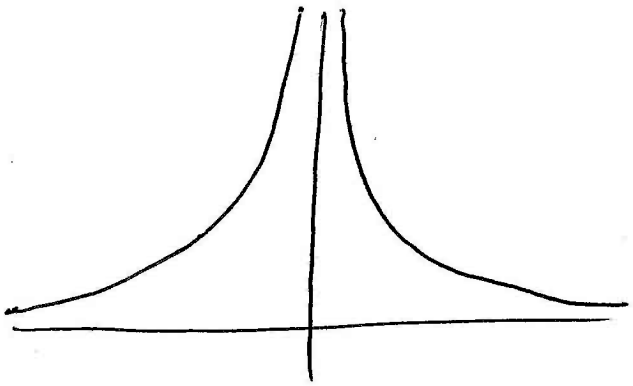
$y = +\frac{1}{x}$





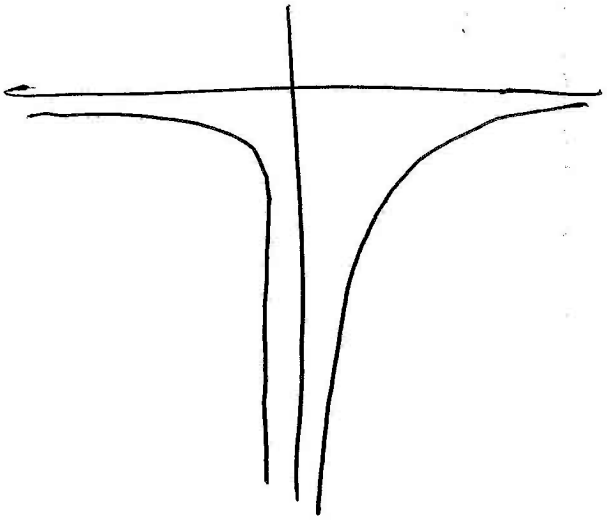
(ii)

$y = \frac{1}{x^2}$



(3) - (a)

$y = -\frac{1}{x^2}$



Plotting graphs:

(1) Complete the table

Mode + 7

$f(x) =$ ~~Type equation~~

~~Start~~ : first missing value.

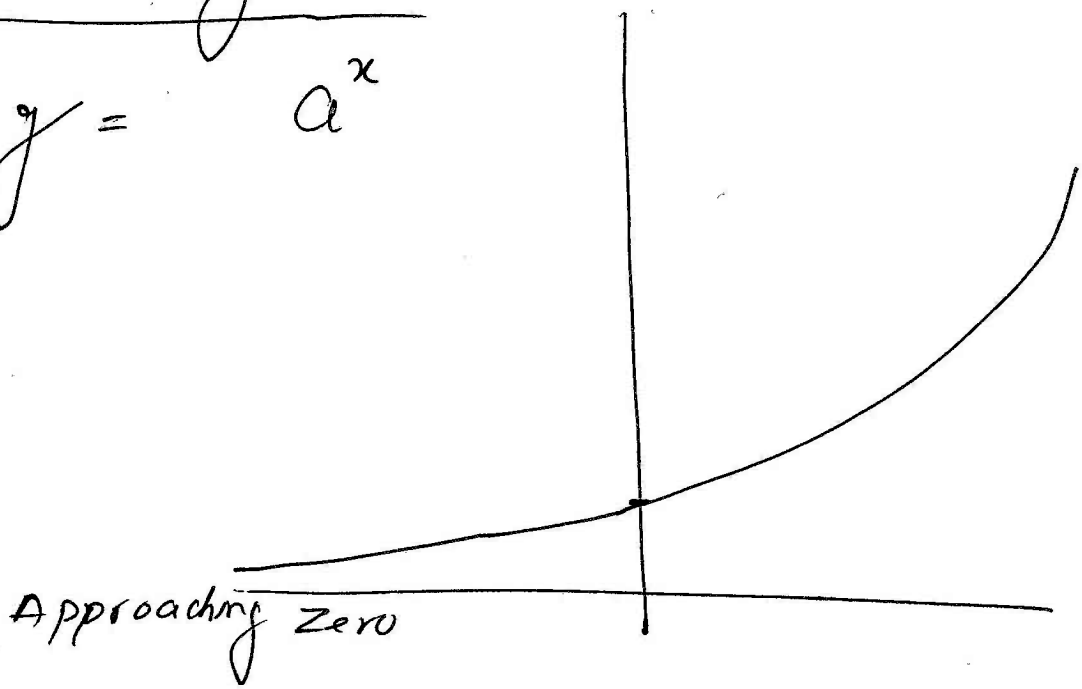
~~END~~ : Last missing value

~~Step~~ : Interval between x-value.

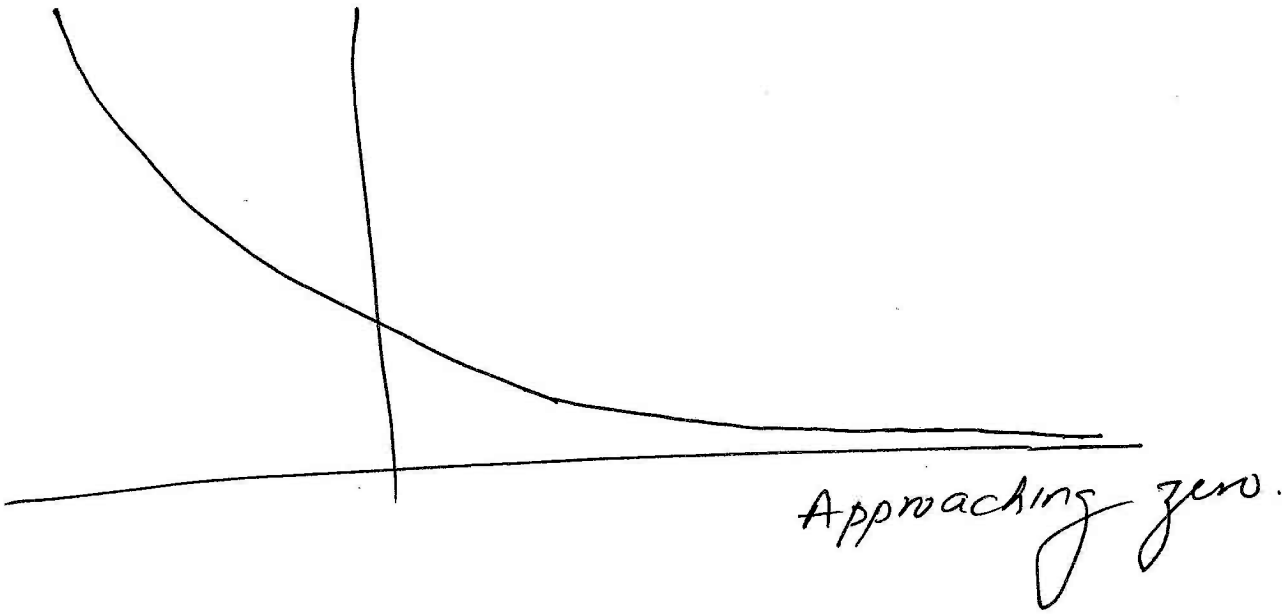
(3) b

exponential growth

$y = a^x$



exponential Decay:



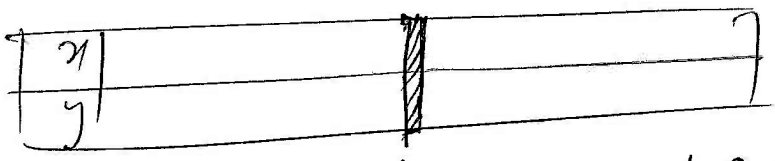
(4)

$y = 2x^3 + 4x^2$

x	-2.2	-2	-1.5	-1	-0.5	0	0.5	0.8
y	-1.94	0	2.25	2	0.75	0	1.25	3.58

Step#2 Plot the points (x, y) on the grid.

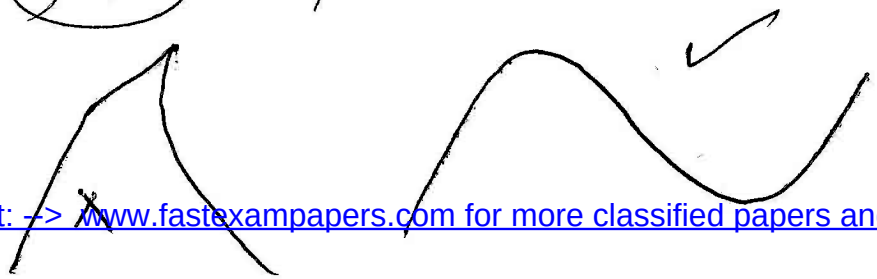
Step:3 Connet the point to get a smooth curve.

→ 

* Two separate Curve

or $x \neq c$

← No Sharp (ponty) Turn.



Graphical Solutions

Solving any equation using graphs.

* → change the given equation in Terms of y

* → Draw the graph (line) of the New equation $y = \_\_\_\_$

* → Record the points of Intersection of line & curve.

* → Write x-values of Intersection.

Gradients of Curves :

(i) finding gradient :

→ Draw the Tangent to the curve of $x = c$ at given value

Tangent: touches curve at one point.

→ Take any Two (far) points on the Tangent Line.

Use one of the given point.

(x_1, y_1) & (x_2, y_2)

→ Calculate

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Check your answer

in calculator

[Shift] [$\int$ □]

gives $\frac{d}{dx}$ (Type equation) $x =$ [given]

(ii) Gradient Trend.

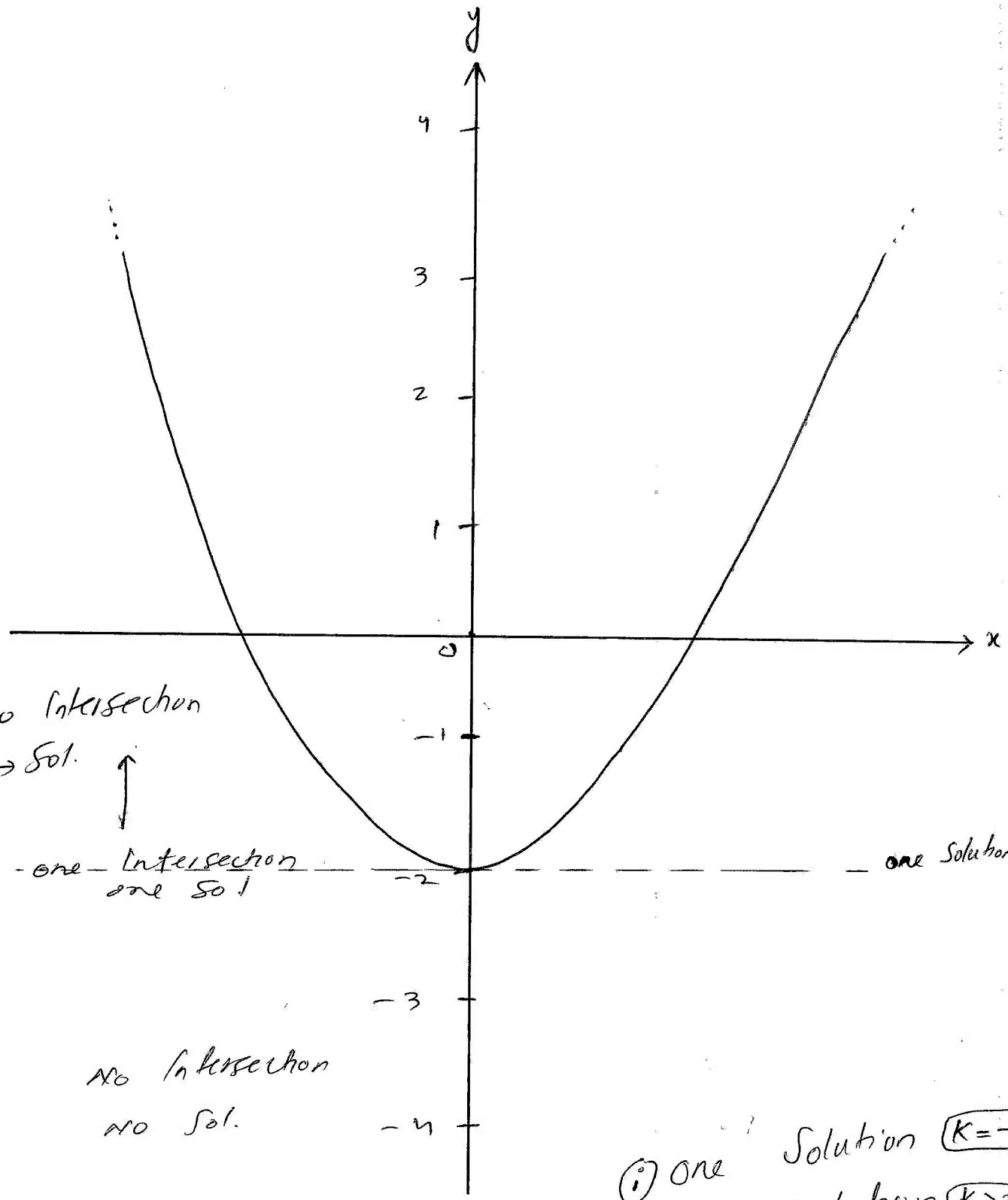
(1) at Turning points (peaks) (max or min)

gradient = 0 Tangent is Horizontal.

(2) if the graph is Rising up then gradient is positive.

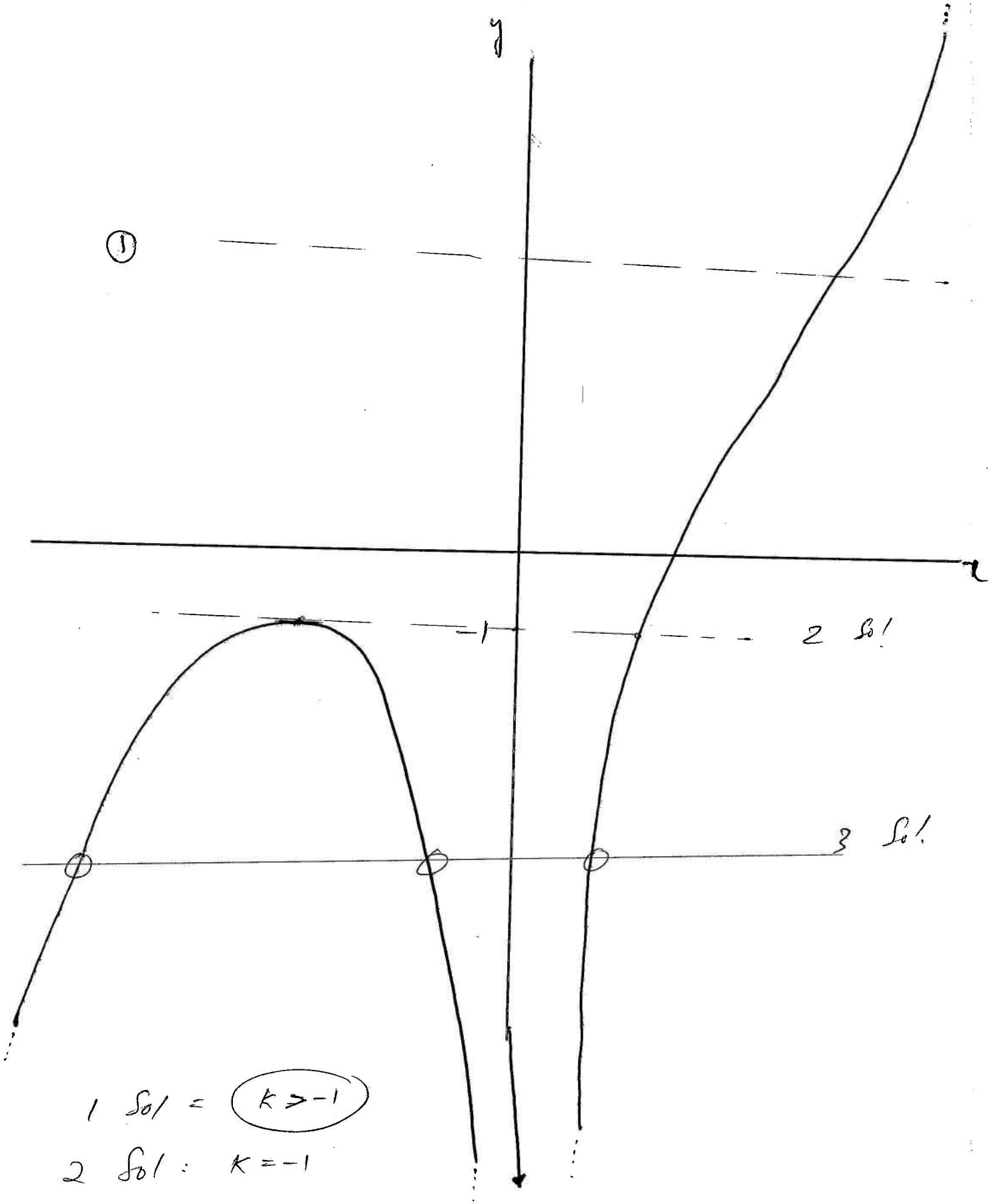
(3) if the graph is falling down gradient is negative.

find range of values of (7) (K) or (J) or (x)



y = K (Horizontal)

(1) one Solution K = -2
(2) Two Solution K > 2
(3) No solution: K < -2



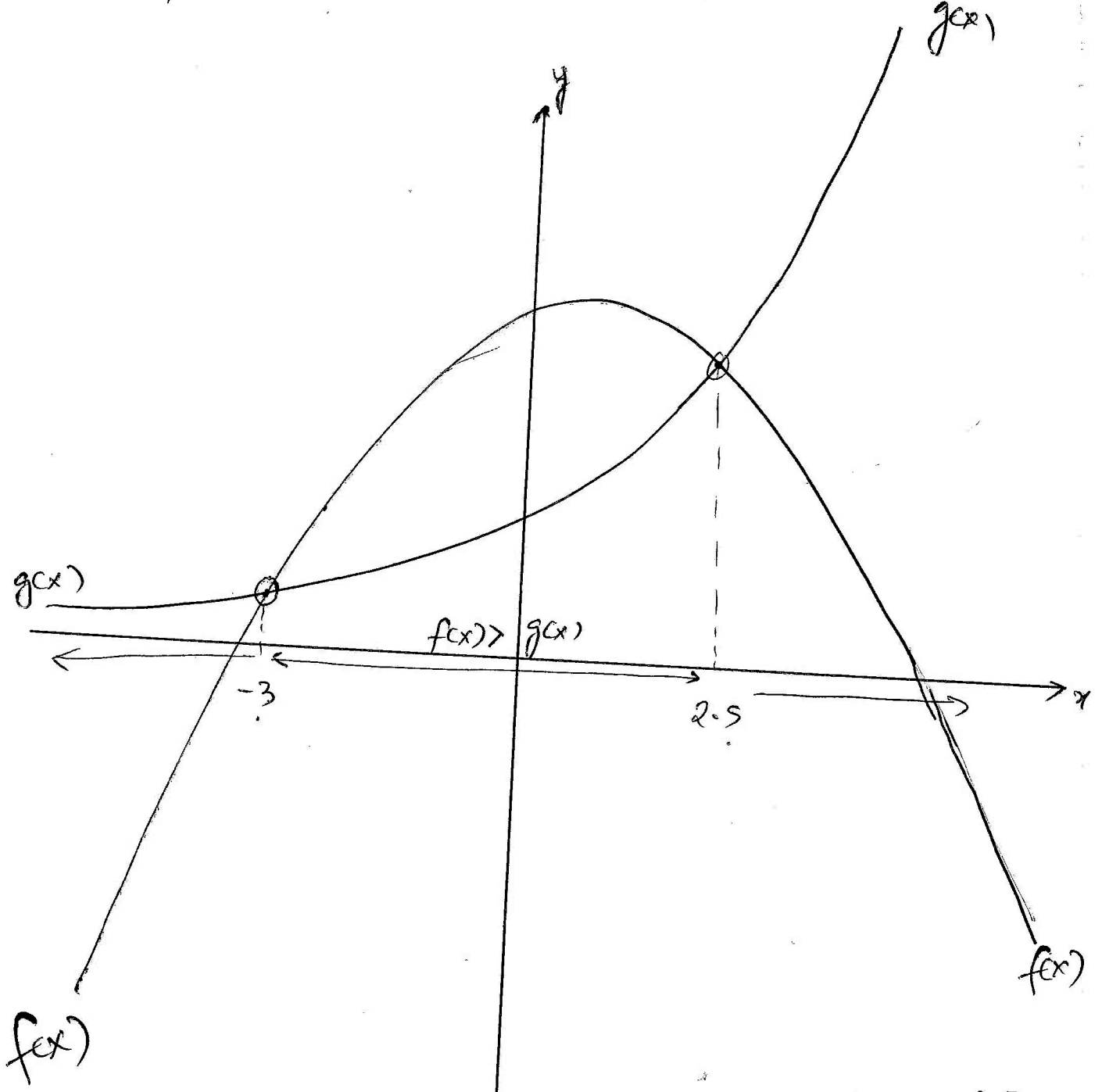
1 Sol = $k > -1$

2 Sol : $k = -1$

3 Sol : $k < -1$

Two Curves

f(x) & g(x)



(i) $f(x) = g(x)$ → the points where the curves Cut

$x = -3, \quad x = 2.5$

(ii) $f(x) > g(x)$ → for those values where curve of f(x) is above g(x)

$-3 < x < 2.5$

(iii) $f(x) < g(x)$:→ for those values of where f(x) is below g(x) $x < -3$ & $x > 2.5$