

$$\text{MIN } Z = 2x_1^2 - 24x_1 + 2x_2^2 - 8x_2 + 2x_3^2 - 12x_3 + 200$$

Sol:

$$f(x_1) = 2x_1^2 - 24x_1$$

$$f(x_2) = 2x_2^2 - 8x_2$$

$$f(x_3) = 2x_3^2 - 12x_3 + 200$$

now,

$$df/dx_1 = 4x_1 - 24$$

$$d^2f/dx_1^2 = 4 > 0$$

function $f(x_1)$ is convex

Again,

$$df/dx_2 = 4x_2 - 8$$

$$d^2f/dx_2^2 = 4 > 0$$

function $f(x_2)$ is convex

Again,

$$df/dx_3 = 4x_3 - 12$$

$$d^2f/dx_3^2 = 4 > 0$$

function $f(x_3)$ is convex

$f(x_1)$, $f(x_2)$ and $f(x_3)$ are convex so the function $f(x_1, x_2, x_3)$ i.e Z is also convex .

