Solve the linear programming using the simplex method:

i. Maximize $Z = 10x_1 + 6x_2$
subject to,
$6x_1 + 4x_2 \leq 80$
$4x_1 + 6x_2 \leq 100$
where $x_1, x_2 \geq 0$

ii. Maximize $Z = 4x_1 + 8x_2$
subject to,
$x_1 + 2x_2 \leq 5$
$x_1 + x_2 \leq 4$
where $x_1, x_2 \geq 0$

iii. Maximize $Z = 6x_1 + 7x_2$
subject to,
$x_1 - x_2 \leq 12$
$x_1 + 3x_2 \leq 18$
where $x_1, x_2 \geq 0$

iv. Minimize $Z = 6x + 8y$
With subject to constraints,
$4x + 3y \geq 120$
$3x + 6y \geq 120$
Where $x, y \geq 0$

v. Minimize $Z = 60x_1 + 80x_2$
With subject to constraint,
$x_1 \leq 400$
$x_2 \geq 200$
$x_1 + x_2 = 500$
where $x_1, x_2 \geq 0$

vi. Minimize $Z = 3x + 2y$
with subject to constraint,
$2x + 4y \geq 10$
$4x + 2y \geq 10$
$y \geq 4$
where $x, y \geq 0$

Answers

i. $x_1 = 13.33$, $x_2 = 0$, Max(Z) = 133.33
ii. $x_1 = 0$, $x_2 = 5/2$, Max(Z) = 20
iii. $x_1 = 13.5$, $x_2 = 1.5$, Max(Z) = 91.5
iv. x = 24, y = 8, Min(Z) = 208
v. $x_1 = 300$, $x_2 = 200$, Min(Z) = 34,000
vi. x = 4, y = 1/2, Max(Z) = 13