Big M method

Solve using Big M

$$\text{Min } z = 7x_1 + 15x_2 + 20x_3$$

$$2x_1 + 4x_2 + 6x_3 \geq 24$$

$$3x_1 + 9x_2 + 6x_3 \geq 30$$

$$x_1, x_2, x_3 \geq 0$$

$$\text{Min } z = 7x_1 + 15x_2 + 20x_3$$

$$2x_1 + 4x_2 + 6x_3 - S_1 + A_1 = 24$$

$$3x_1 + 9x_2 + 6x_3 - S_2 + A_2 = 30$$

$$x_1, x_2, x_3, S_1, S_2, A_1 \text{ and } A_2 \geq 0$$

$$Z = 7x_1 + 15x_2 + 20x_3 + 0S_1 + 0S_2 + MA_1 + MA_2$$

	C_j	7	15	20	0	0	M	M		
CB	Bv	x_1	x_2	x_3	S_1	S_2	A_1	A_2	Soln	Ratio
M	A_1	2	4	6	-1	0	1	0	24	$24/4 = 6$
M	A_2	3	9	6	0	-1	0	1	30	$30/9 = 10/3$
	Z_j	5M	13M	12M	-M	-M	M	M	54M	
	$C_j - Z_j$	7-5M	15-13M	20-12M	M	M	0	0		

Optimality Condith = $C_j - Z_j \geq 0$

	C_j	7	15	20	0	0	M	M		
CB	Bv	x_1	x_2	x_3	S_1	S_2	A_1		Sol^n	Ratio
M	A_1	$\frac{2}{3}$	0	$\frac{10}{3}$	-1	$\frac{4}{9}$	1		$\frac{32}{3}$	$\frac{16}{5}$ ←
15	X_2	$\frac{1}{3}$	1	$\frac{2}{3}$	0	$-\frac{1}{9}$	0		$\frac{10}{3}$	5
	Z_j	$\frac{2}{3}M+5$	15	$\frac{10}{3}M+10$	-M	$\frac{4}{9}M-\frac{5}{3}$	M		$\frac{32M+50}{3}$	
	C_j-Z_j	$2-\frac{2}{3}M$	0	$10-\frac{10}{3}M$	M	$\frac{5}{3}-\frac{4}{9}M$	0			