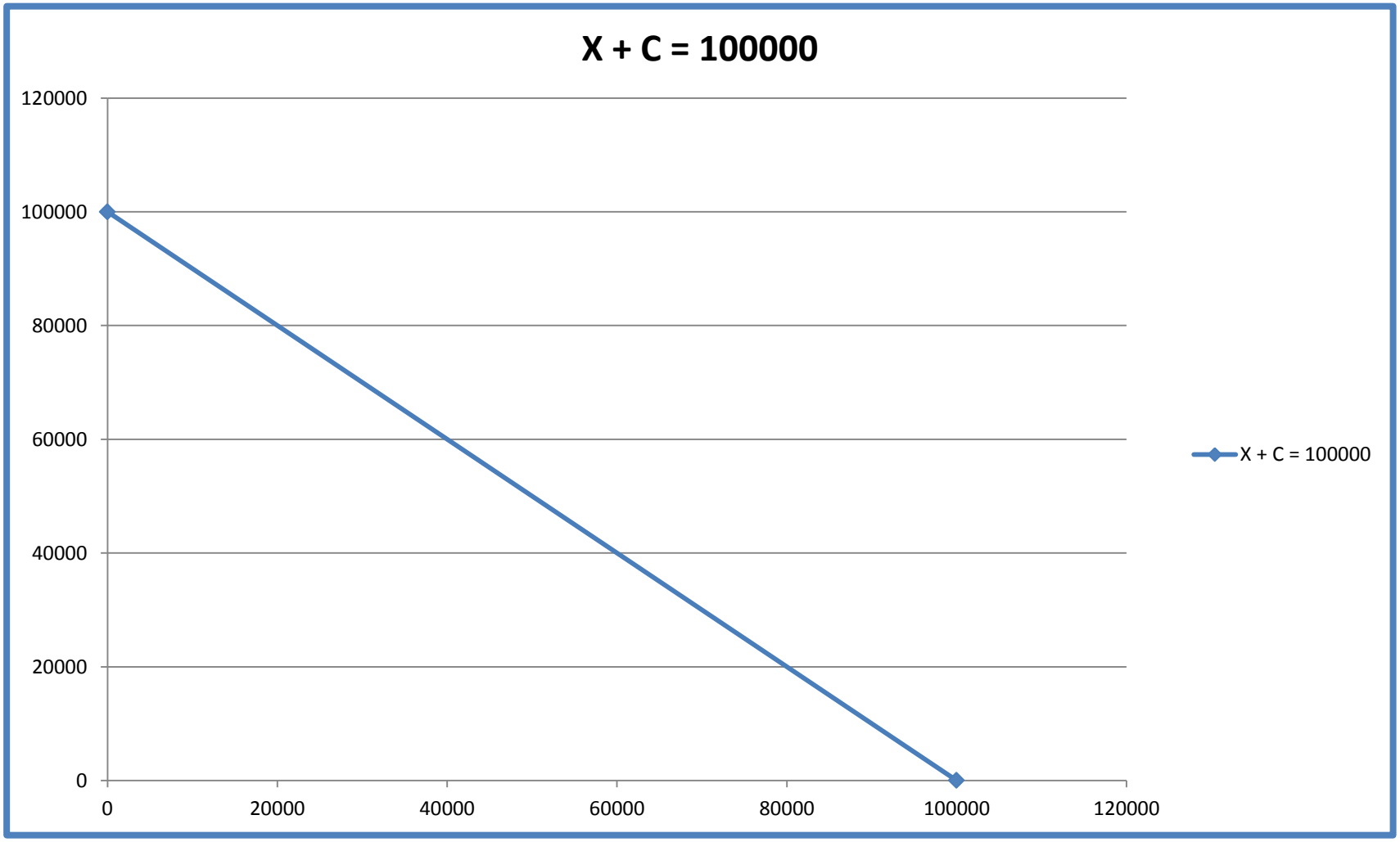
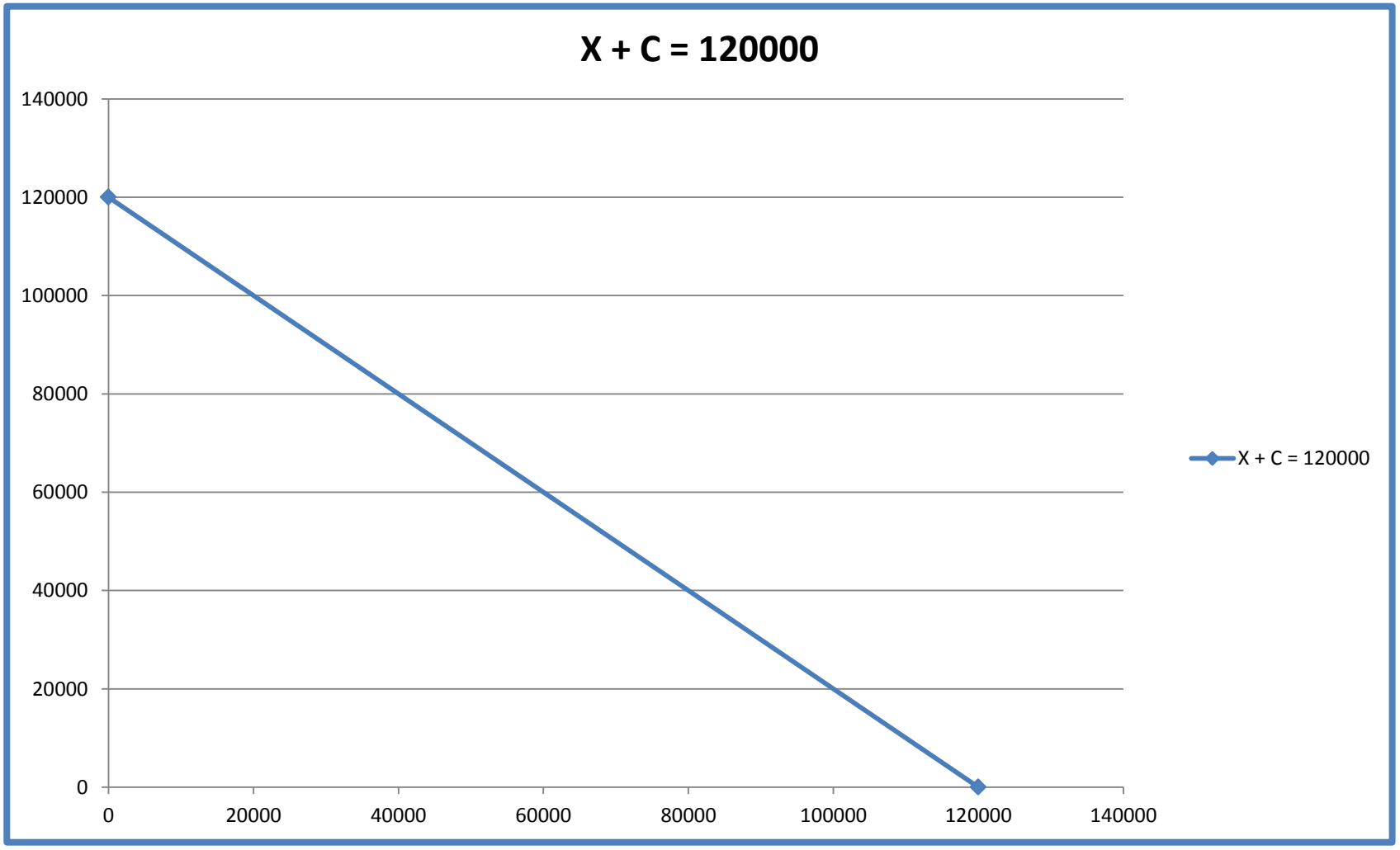
EC4101 Tutorial 1

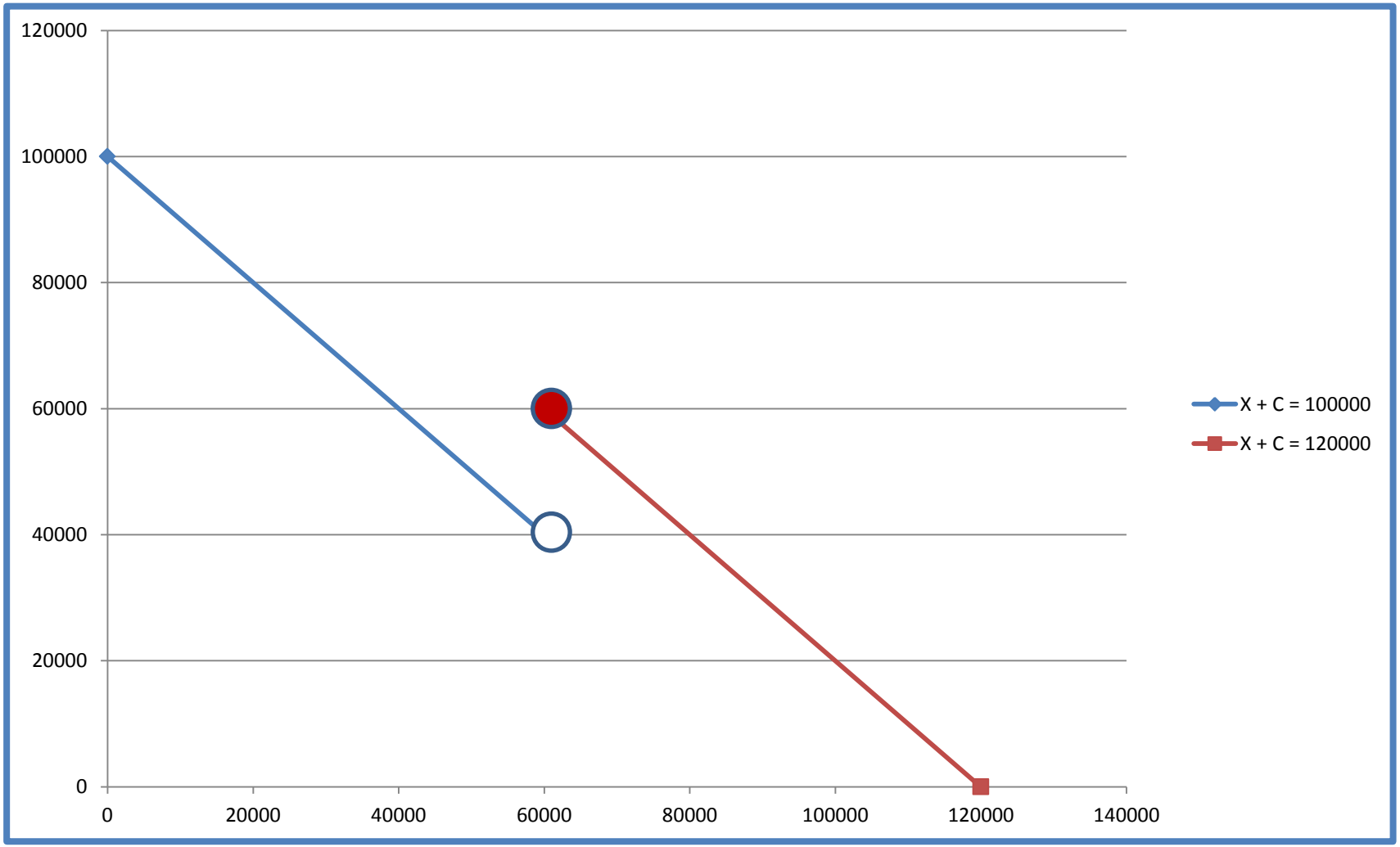
No Plan


X + C = 100000
120000
100000
80000
60000
40000
20000
0
0
20000
40000
60000
80000
100000
120000
X + C = 100000

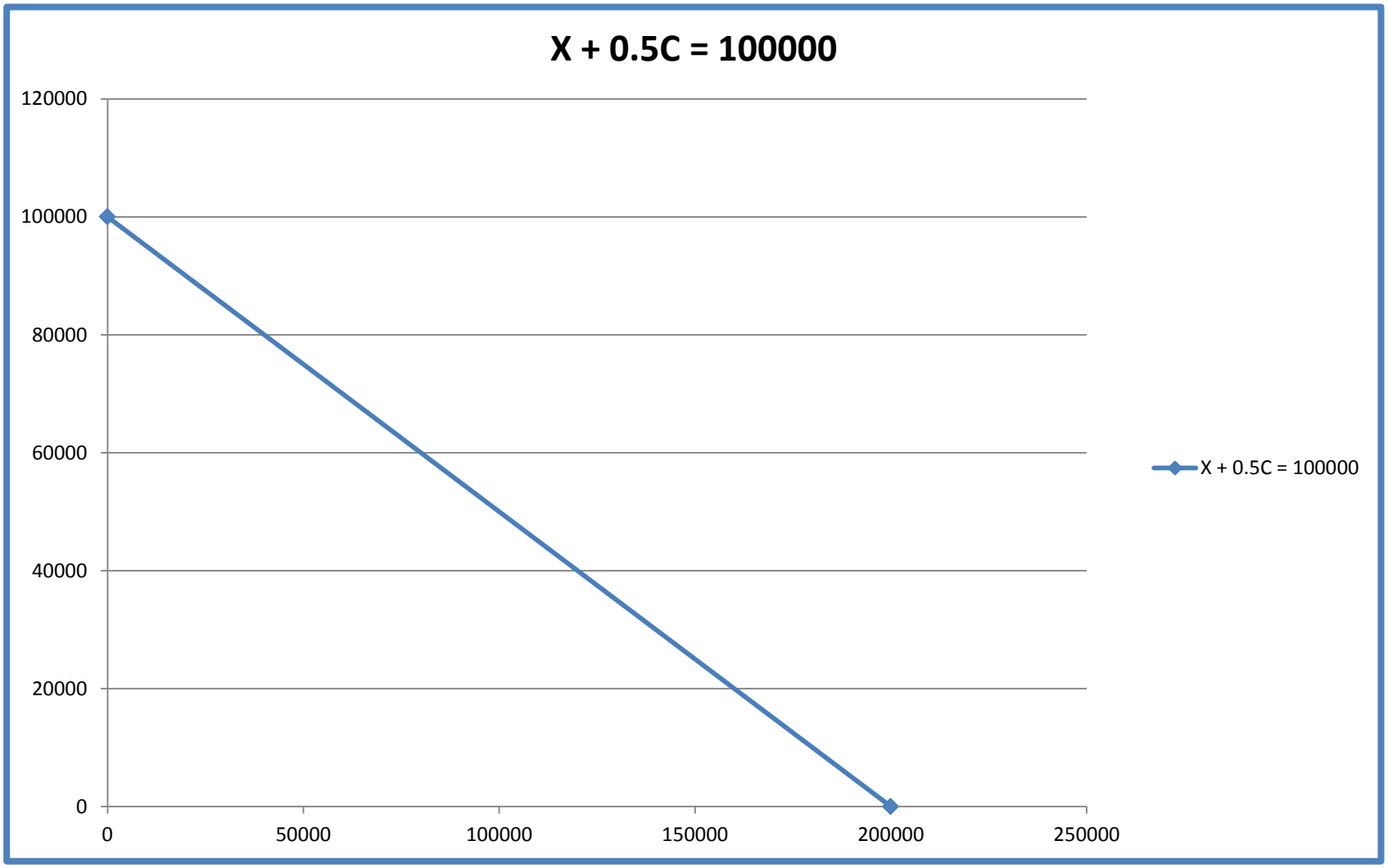
Plan A


X + C = 120000
140000
120000
100000
80000
60000
40000
20000
0
0
20000
40000
60000
80000
100000
120000
140000
X + C = 120000

Plan B


120000
100000
80000
60000
40000
20000
0
0
20000
40000
60000
80000
100000
120000
140000
X + C = 100000
X + C = 120000

Plan C


X + 0.5C = 100000
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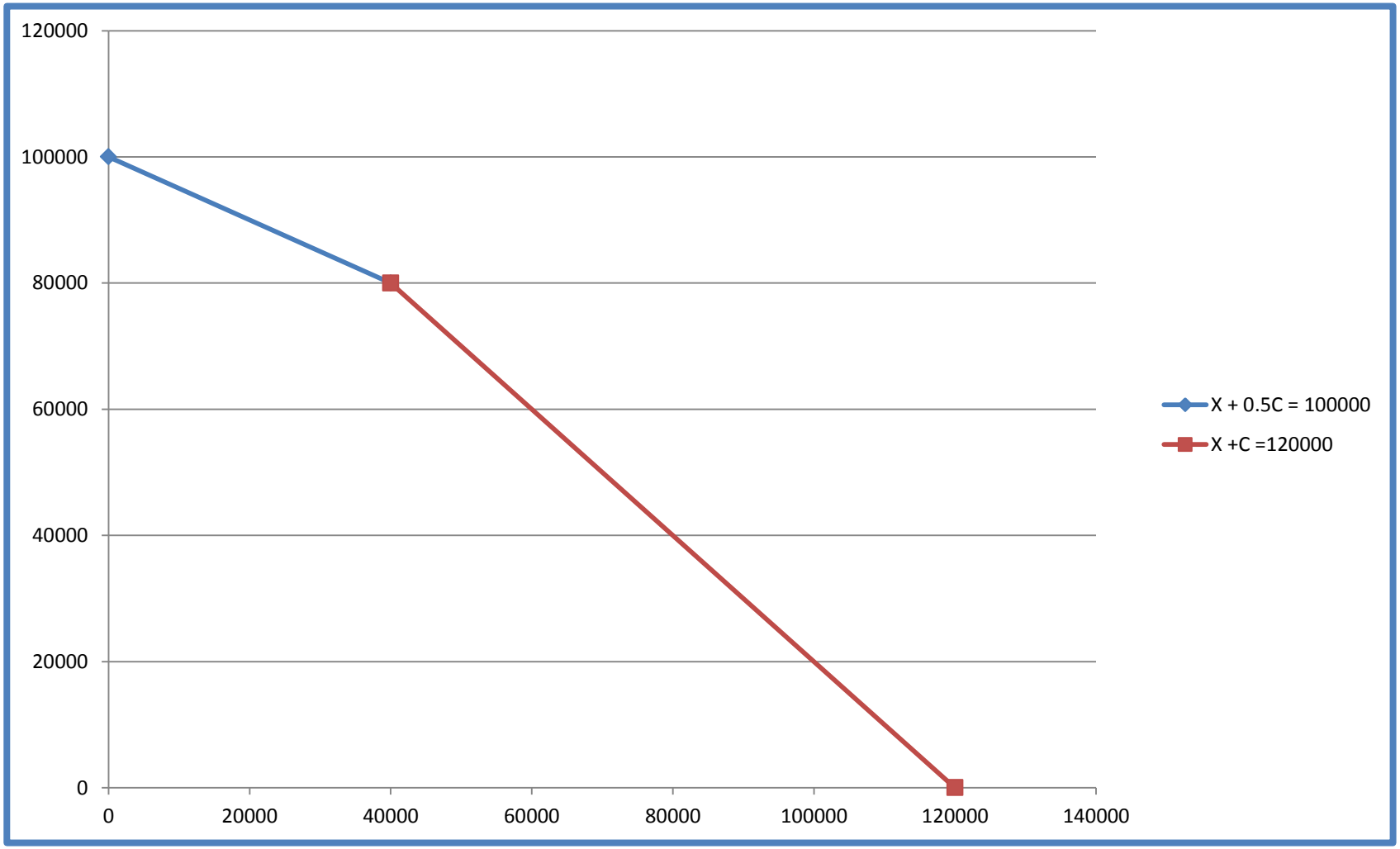
100000
80000
60000
40000
20000
0
0
50000
100000
150000
200000
250000
X + 0.5C = 100000

Plan D


120000
100000
80000
60000
40000
20000
0
0
20000
40000
60000
80000
100000
120000
140000
X + 0.5C = 100000
X +C =120000

No Plan

- Budget line equation→ X + C = 100000

Given $U = C^2X^3$

$\frac{dx}{dc} = -\frac{2CX^3}{3C^2X^2} = -\frac{2X}{3C}$ (implicit differentiation)

MRS = $\frac{Pc}{Px}$ → $-(-\frac{2X}{3C}) = \frac{1}{1}$

$X = \frac{3}{2}C$ → sub in to budget line equation:

$\frac{3}{2}C + C = 100000$ → C*= $40000

Plan A

- Budget line equation→ X + C = 120000

Given $U = C^2X^3$

$\frac{dx}{dc} = -\frac{2CX^3}{3C^2X^2} = -\frac{2X}{3C}$ (implicit differentiation)

MRS = $\frac{Pc}{Px}$ → $-(-\frac{2X}{3C}) = \frac{1}{1}$

$X = \frac{3}{2}C$ → sub in to budget line equation:

$\frac{3}{2}C + C = 120000$ → C*= $48000

Plan B

- Budget line equation

→ $X + C = 100000$ for $C<60000$

→ $X + C = 120000$ for $C \geq 60000$

Given $U = C^2X^3$

$\frac{dx}{dc} = -\frac{2CX^3}{3C^2X^2} = -\frac{2X}{3C}$ (implicit differentiation)

MRS = $\frac{Pc}{Px}$ → $-(-\frac{2X}{3C}) = \frac{1}{1}$

$X = \frac{3}{2}C$ → sub in to $X + C = 100000$

$\frac{3}{2}C + C = 100000$ → $C^* = \$40000$

$X = \frac{3}{2}C$ → sub in to $X + C = 120000$

$\frac{3}{2}C + C = 100000$ → $C^* = \$48000$ out of domain

Plan C

- Budget line equation→ X + 0.5C = 100000

Given $U = C^2X^3$

$\frac{dx}{dc} = -\frac{2CX^3}{3C^2X^2} = -\frac{2X}{3C}$ (implicit differentiation)

MRS = $\frac{Pc}{Px}$ → $-(-\frac{2X}{3C}) = \frac{1}{2}$

$X = \frac{3}{4}C$ → sub in to budget line equation:

$\frac{3}{4}C + \frac{1}{2}C = 100000$ → C*= $80000

Plan D

- Budget line equation

→ X + 0.5C = 100000 for 0≤C ≤ 40000

→ X + C = 120000 for C≥40000

$From\ Plan\ C$, C*= $80000, out of domain

Given $U = C^2X^3$

$\frac{dx}{dc} = -\frac{2CX^3}{3C^2X^2} = -\frac{2X}{3C}$ (implicit differentiation)

MRS = $\frac{Pc}{Px}$ → $-(-\frac{2X}{3C}) = \frac{1}{1}$

$X = \frac{3}{2}C$ → sub in to X + C = 120000 :

$\frac{3}{2}C + C = 120000$ → C*= $48000