p163/#4 Vitamin Prob

Let x = # daily units of A
y = # " " " B

a) $.06x + .05y = C$

b) $x \leq 600$
$y \leq 500$
$400 \leq x+y \leq 1000$ → $x+y=1000$ (500, 500) (400, 600)
$y = -x+1000$
$y \geq \frac{1}{2}x$
$y \leq 3x$

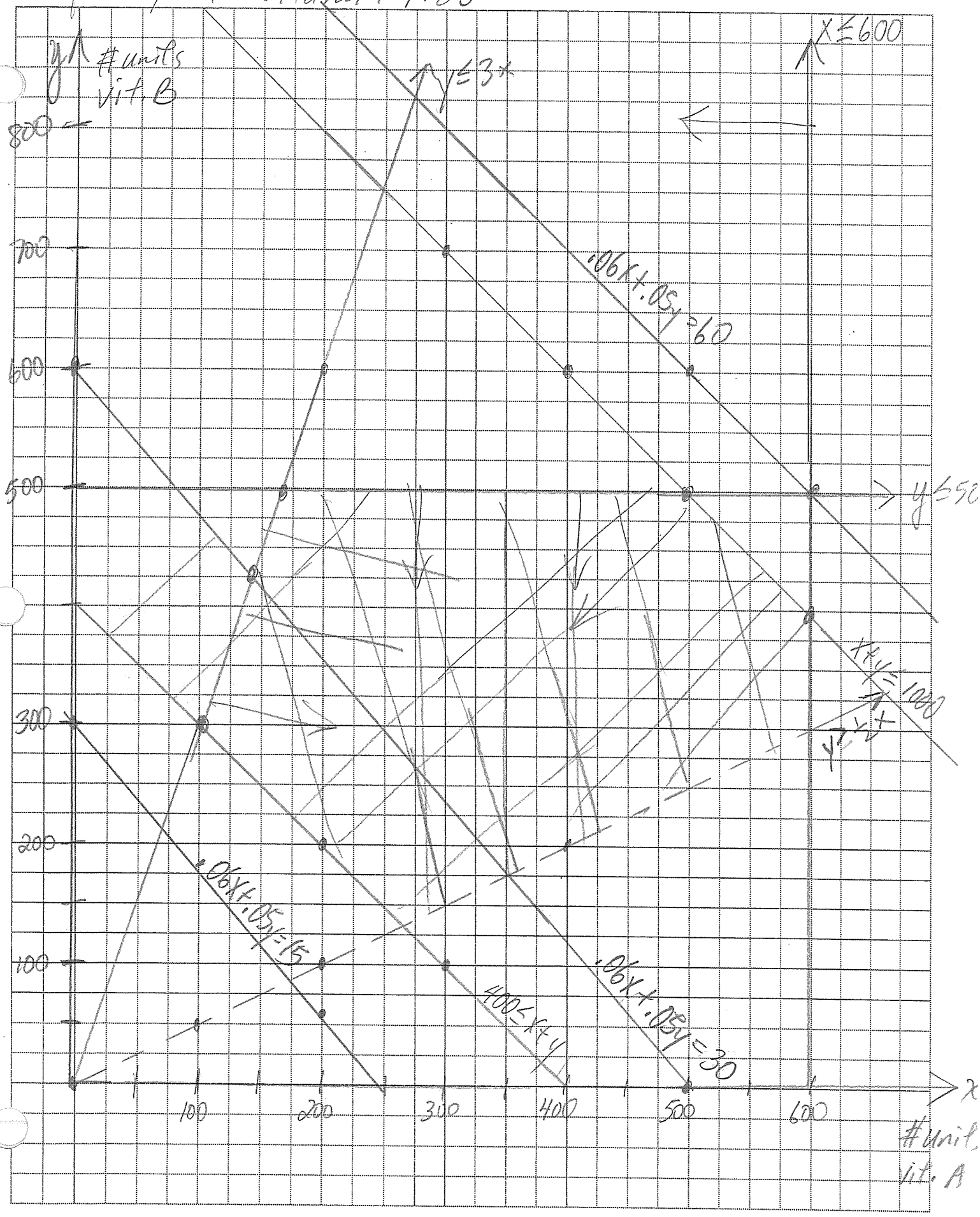
c) feasible doses

d) i) $.06x + .05y = 60 \rightarrow y = -\frac{6}{5}x + 1200$
ii) $.06x + .05y = 30 \rightarrow y = -\frac{6}{5}x + 600$
iii) $.06x + .05y = 15 \rightarrow y = -\frac{6}{5}x + 300$

e) 60¢/day – NO; line outside of feasible region
30¢/day – Yes, line inside of " "
15¢/day – NO, line outside " "

f) The word is "optimum" point.
Point is (100, 300).
$C = .06(100) + .05(300)$
Min. = 21¢/day.

p. 163/#4 Vitamin Prob



p167/#9 Linear Programming

Let x = # of dozen C.C. cookies
y = # of " oat. b. "

$x \le 20$
$y \le 40$
$x + y \le 50$
$y \le 3x$ → (10, 30) (20, 60) (0, 0)
$x + 1.5y = P$

A (0, 0)
B (12.50, 37.50)
C (20, 30)
D (20, 0)

Vertices	Profit $x + 1.5y = P$
(0, 0)	0
(12.50, 37.50)	68.75 ←
(20, 30)	65
(20, 0)	20

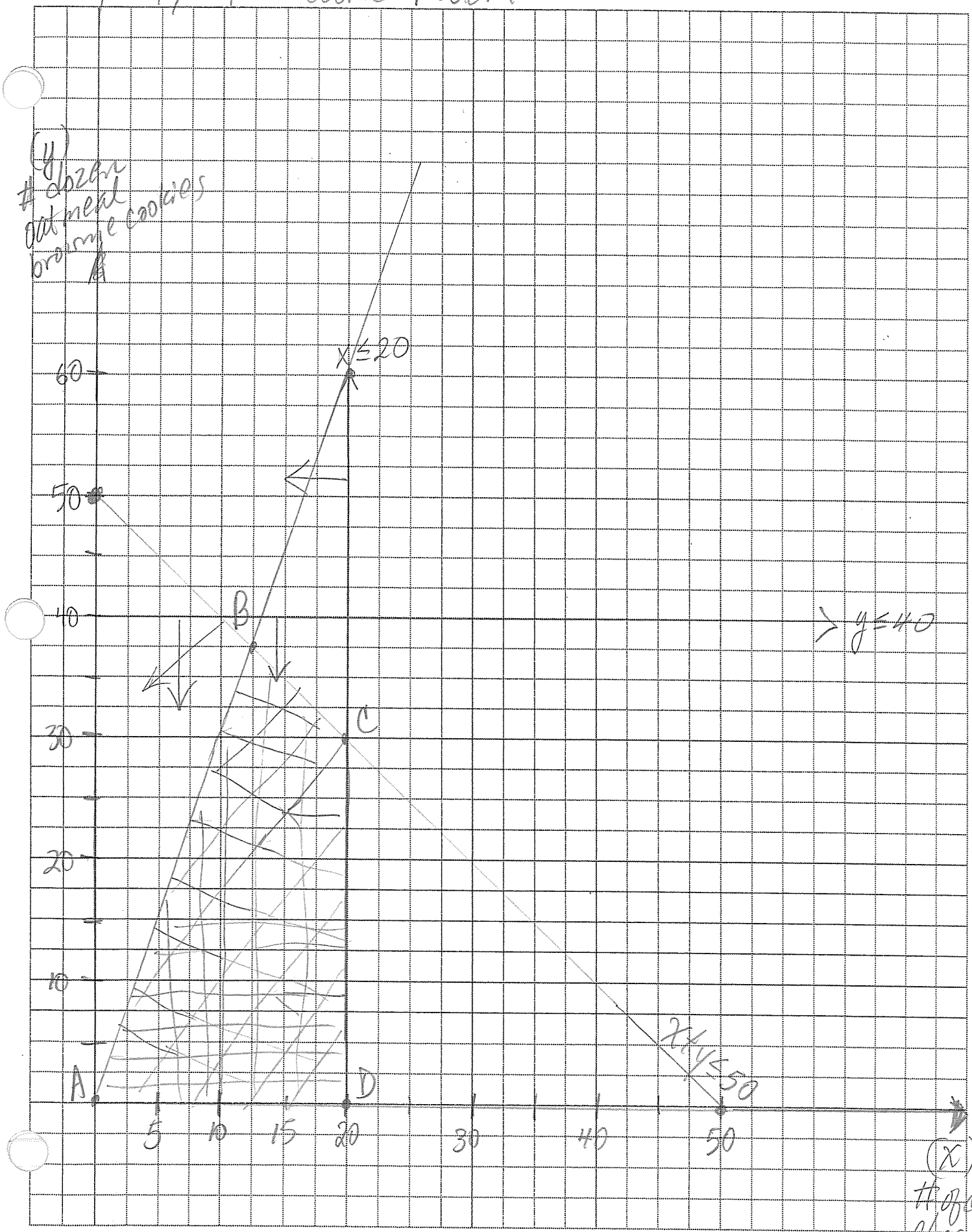
Answer:
$12\frac{1}{2}$ dz. ch. chip
$37\frac{1}{2}$ dz. oat. b.
$68.75

12.50 → 13 or 12
37.50 → 37 or 38

(13, 37)	✓ $68.50
(12, 38)	→ fails $y \le 3x$

Unnecessary because text had answers in $\frac{1}{2}$ dozens.

p.167/#9 Cookie Problem



p167/#10 Christmas Tree

let x = # of real trees
y = # of artificial trees

$20 \le x \le 90$

$y \le 100$

$50 \le x+y \le 120$

$y \ge \frac{1}{2}x$

$80x + 160y = C$

$x+y \le 120$ (30, 90) (50, 70) (70, 50)

$x+y \ge 50$ (0, 50) (50, 0)

$y = \frac{1}{2}x$ (20, 10) (60, 30)

Vertices	Cost $80x+160y=C$
(20, 30)	6400
(20, 100)	17,600
(80, 40)	12,800
$(\frac{100}{3}, \frac{50}{3})$	5333.33

$x+y=50$

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

$x+\frac{1}{2}x=50$

$\frac{3}{2}x=50$

$x=\frac{100}{3}$

$y=\frac{1}{2}\cdot\frac{100}{3}=\frac{50}{3}$

$80(\frac{100}{3})+160(\frac{50}{3})=C$

$\frac{8000}{3}+\frac{8000}{3}=C$

$\frac{16000}{3}=C$

5333.

(real, art.)	minimum feasible amt.
33, 16	X b/c less than 50
33, 17	5360
34, 16	X fails $y \ge \frac{1}{2}x$
34, 17	5440

Answers

33 real
17 artificial
$5360 minimum

Marica should buy 33 real and 17 artificial trees and invest $5360.

p167/#10 Christmas Tree Probl.