Solutions 8-16-13

① Mark & Don problem

$T(x) = M(x) + D(x)$

$T(x)$ = total number of marble
$= 113$

$M(x)$ = number of marbles mark has

$D(x)$ = number of marbles Don has

Since Don is described in terms of Mark $\boxed{M(x) = x}$ ← number of marbles mark has

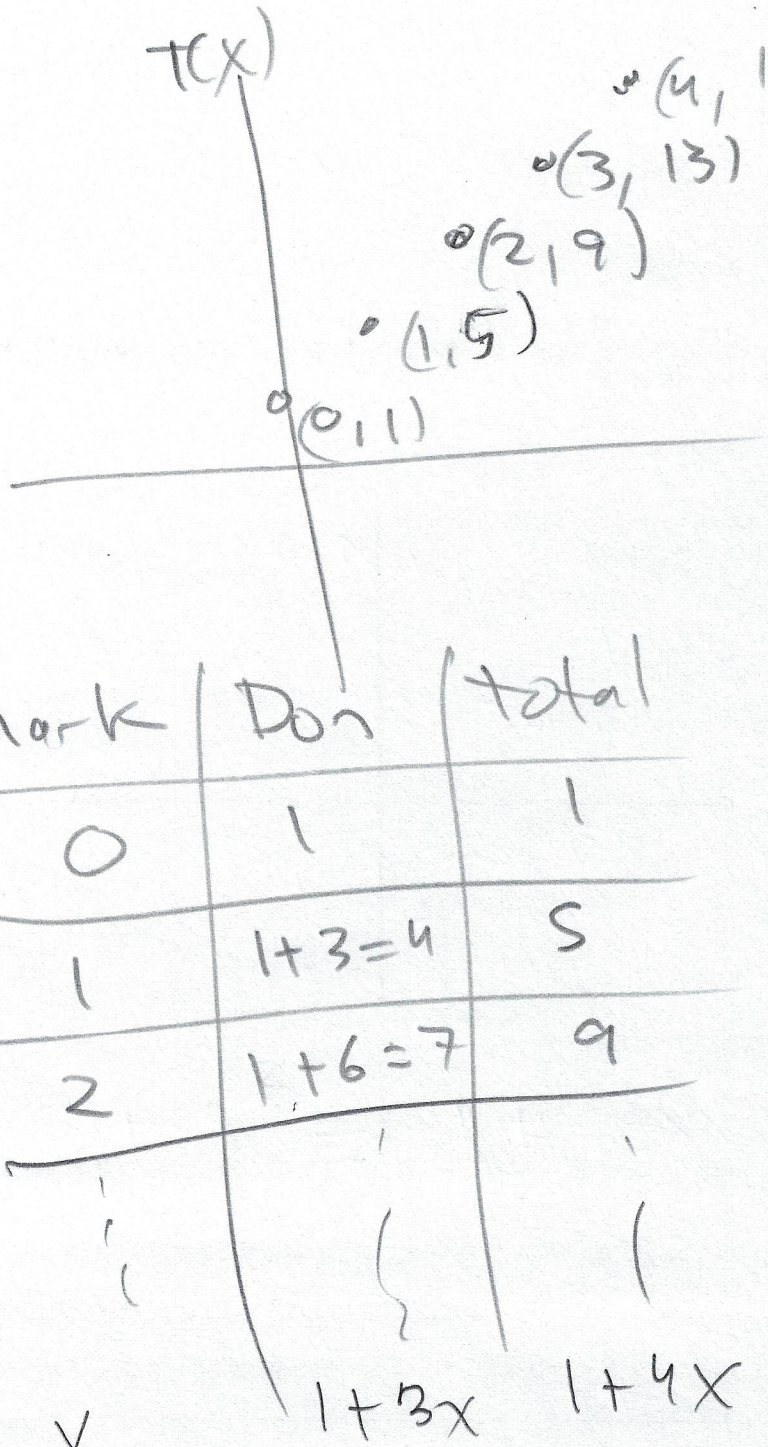
So $\boxed{D(x) = 1 + 3x}$ ← number of marbles Don has

(1)

So $T(x) = M(x) + D(x)$

$= x + 1 + 3x$

$T(x) = 1 + 4x$



this is an example of Discrete Data

mark	Don	total
0	1	1
1	1+3=4	5
2	1+6=7	9

$(x, T(x))$

x ↓ number of marbles mark has

$T(x)$ ↓ total number of marbles

$1 + 4x = 113$

$-1 \quad -1$

$4x = 112$

$x = \frac{112}{4}$

$\boxed{x = 28}$

So we solved for $x = 28$ instead of ASSUMING we are right lets check

$x = 28$ means $D(x) = 1 + 3(28)$

$= 1 + 84$

$= 85$

$\therefore$ We Gave $D + M = 85 + 28$

$= 113$

② Beth & Ann Problem

$S = B + A$ $\qquad B = 2A$

$S = 2A + A$

$S = 3A$

Since Sam's age is 69

$69 = 3A$

$\boxed{A = \frac{69}{3} = 23}$

Ann is 23 years old

So $B(A) = 2A \Rightarrow B(23) = 2(23)$

$= 46$

Beth is 46 years old

So $S = B + A \Rightarrow \boxed{69 = 46 + 23 = 69}$

(3) Ruben & Hahn Problem

total applications to Begin

$$R + H = T_{Begin}$$

$$R = H + 8$$

$$H = H$$

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total Applications after extras

$$R + 3 = R_{now} = H + 8 + 3 = H + 11$$

$$H + 3 = H_{now} = H + 3$$

$$T_{now} = R_{now} + H_{now}$$

$$= H + 11 + H + 3$$

$$\boxed{T_{now} = 2H + 14}$$

3 cont

$T_{now} = 28$

So

$28 = 2H + 14$

$-14 \quad -14$

$14 = 2H$

$\frac{14}{2} = \frac{2H}{2}$

$7 = H$

Hahn originally made 7 applications

So

Ruder made

$7 + 8 = 15$

Originally $R = 15$ $H = 7$

Now $R_{now} = 15 + 3 = 18$ $H_{now} = 7 + 3 = 10$

$18 + 10 = 28$

Telephone Problem (4-8)

x = number of minutes used

$A(x)$ = cost of Company A in terms of minutes

$A(x) = 20 + 0.05x$

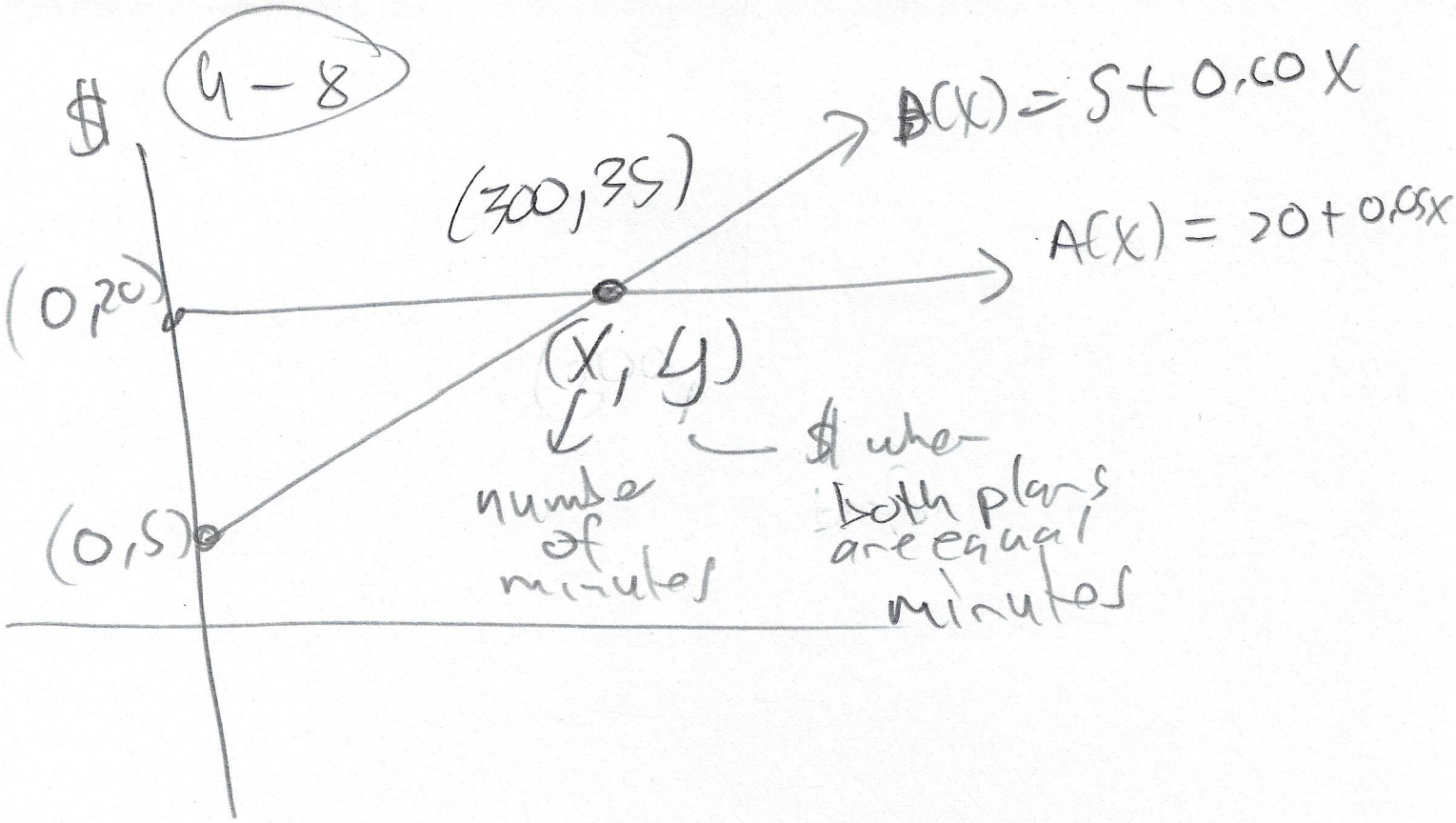
- 20: flat fee
- 0.05: variable fee
- x: number of minutes

$B(x)$ = cost of Company B in terms of minutes

$B(x) = 5 + 0.10x$

- 5: flat fee
- 0.10: variable fee
- x: number of minutes

4-8



Algebraically

$A(x) = B(x)$

$20 + 0.05x = 5 + 0.10x$

-5

$\rightarrow$

$15 + 0.05x = 0.10x$

$-0.05x \quad -0.05x$

$15 = 0.05x$

$$x = \frac{15}{0.05} = 300$$

So $A(300) =$

$20 + 300(0.05)$

$= 35$

$B(300) =$

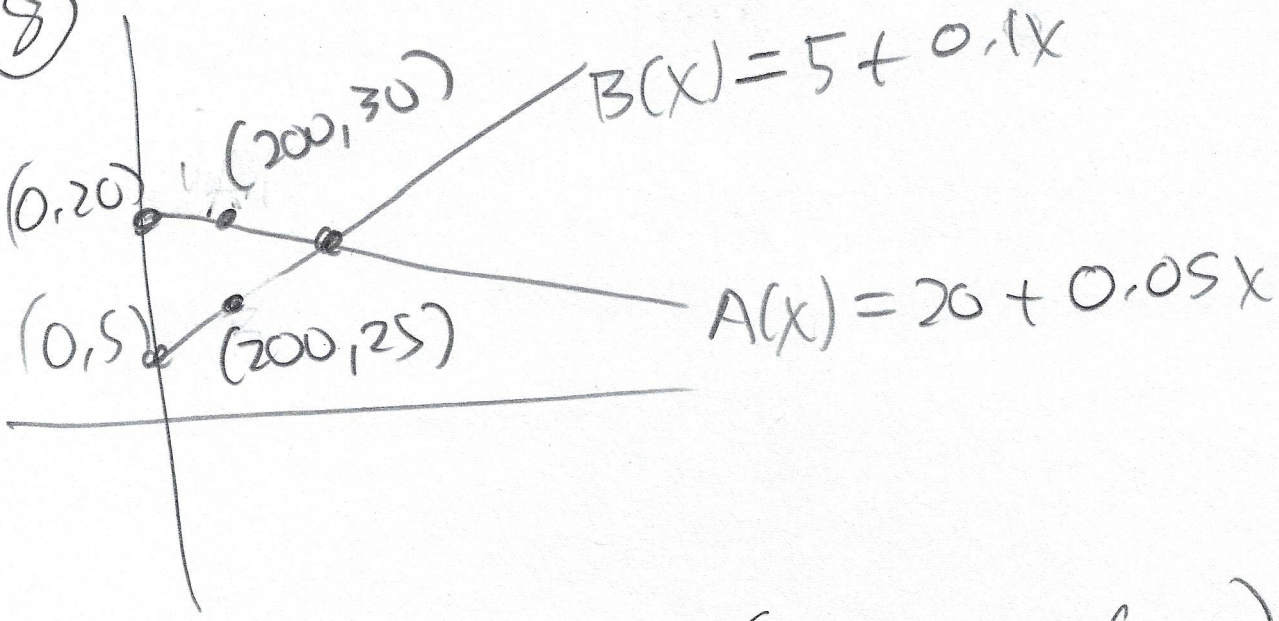
$5 + 0.10(300$

$= 35$

So it takes 300 minutes to have $A(x) = B(x)$ at a cost of $35

telephone Problem (7)

(8)



(4) for $x \in (0, 300)$ (this means when $x < 300$)

A(x) is more expensive than B(x)

So $A(200) > B(200)$

$A(200) = \$30$ $B(200) = \$25$

(6) At $x = 300$ plans are equal cost at \$35

for $x > 300$

B(x) is more expensive than A(x)