2.5

(12) Length = a + b + c

a -> Distance to a

b -> Distance to b

c -> Distance to c

x -> Distance from C point on the main line

$a = \sqrt{(15-x)^2 + 10^2}$

$b = \sqrt{(25-x)^2 + 23^2}$

$c = \sqrt{x^2 + 12^2}$

$L = \sqrt{(15-x)^2 + 10^2} + \sqrt{(25-x)^2 + 23^2} + \sqrt{(x^2 + 12^2}$

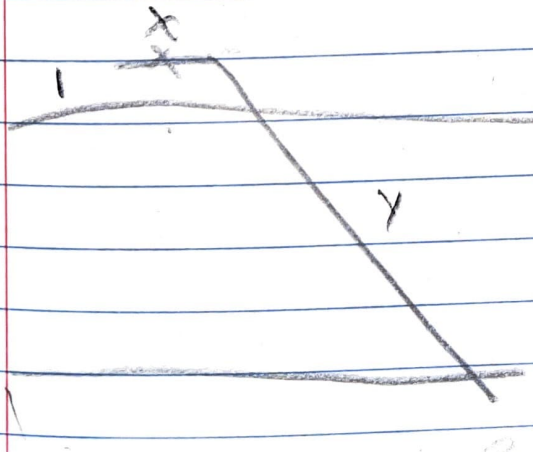
Min = (12.491, 53.813)

12.491 miles to the right (east) of City C

(13) C -> Total cost

x -> Distance from 1

y -> Distance from x to 2



C = cost x + cost y

C = 80(x) + 150(y)

$C = 80(x) + 150\sqrt{((600-x)+200)^2}$

$C = 60x + 150\sqrt{(600-x)^2 + 200^2}$

473.402 m should be laid on land and 236.423m under water

Handout #9

(4) ⑥ For groups 80 or more, the charge is 8 minus 5 cents per person for each person

⑥ $R = 8 - 0.05(n-80)$

$R - 8 = -0.05n + 4$

$R - 12 = -0.05n$

$n = \frac{R-12}{0.05}$

⑦ 120 people would give $720.

$R(n) = n(8 - 0.05(n-80)),\ n \geq 80$

⑤ $f(x) = \frac{2-x}{4} + \frac{\sqrt{x^2+1}}{2}$

She should go to the road 0.577 miles down the road.