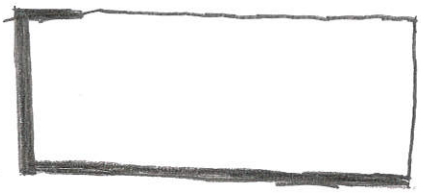
Tito Hashakimana.
Pipeline project.

(a)

i.

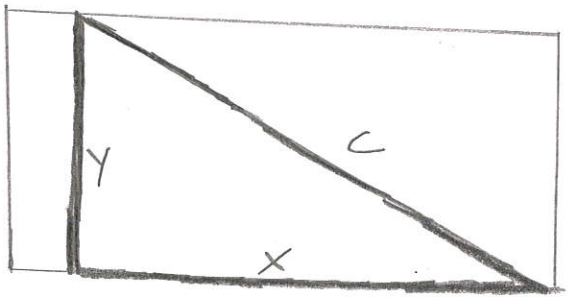


$480,000 x 64 miles
The Route Running west, South And then east to the Refinery would Require 64 miles of the pipe.
This would Cost $30,720,000.

ii.

Drilling Mountain 4,500,000
480,000 /mile x 48 miles
Impact Study $600,000
8 months Delay $100,000 x 8 months
The mountain route would Require 48 miles of pipe, but the fees for drilling through the mountain would make it $26,940,000

b.



i $a^2 + b^2 = c^2$

$(16)^2 + (32)^2 = c^2$

$256 + 1024 = c^2$

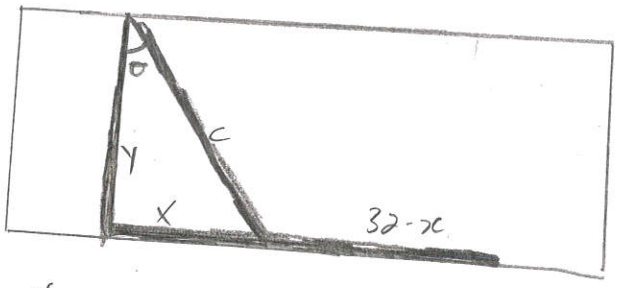
$c = \sqrt{1280} = 35.78$ miles

$480,000 / mile + 360,000 Additional cost = 840,000

$ 840,000 x 35.78 miles

The cost of Running the pipeline the shortes distance across the private ground would be $30,055,200.

ii



$\tan\theta = \frac{x}{16}$

$c^2 = x^2 + (16)^2$

$c = \sqrt{256 + c^2}$

$C = 480,000x + 840,000y$

$C(x) = 480,000(32 - x) + 840,000(\sqrt{256 + c^2})$

$C'(x) = 15,360,000 - 480,000(x) + 840,000(\sqrt{256 + x^2})$

$C'(x) = 0 - 480,000 + \frac{420,000(2x)}{\sqrt{256 + x^2}}$

$C'(x) = \frac{840,000x}{\sqrt{256 + x^2}}$

$480,000(\sqrt{256 + x^2}) = 480,000x$

$\sqrt{256 + x^2} = \frac{840,000x}{480,000} + \frac{48,000}{48000} = \frac{17.5}{10}$

$$\left(\sqrt{256+x^2}\right)^2 = (1.75)^2$$

$$256 + x^2 = 3.06x^2$$

$$256 = 3.06x^2 - x^2$$

$$256 = 2.06x^2$$

$$\frac{256}{2.06} = x^2$$

$$124.27 = x^2$$

$$x = \sqrt{124.27}$$

$$\tan\theta = \frac{11.15}{16}$$

$$\theta = \tan^{-1}\left(\frac{11.15}{16}\right)$$

$$\theta = 34.87$$

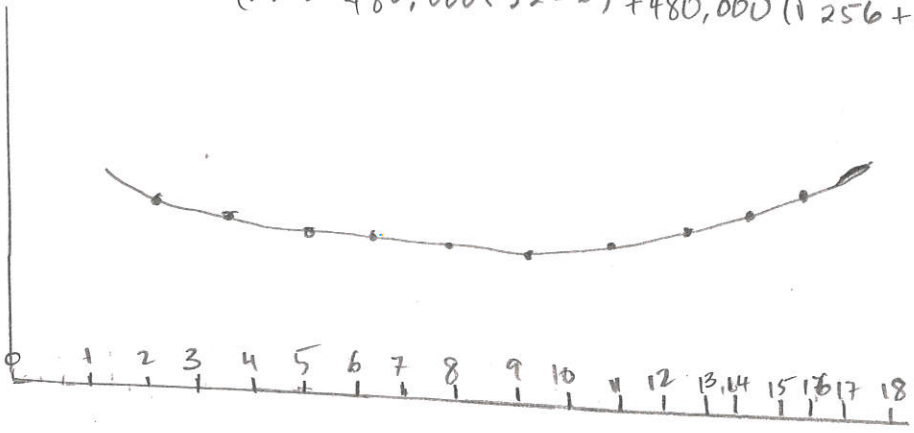
$$Y = \sqrt{256 + (11.15)^2} = \sqrt{380.32} = 19.50$$

$$C = 480{,}000(20.85) + 840{,}000(19.50)$$

$$C = 26{,}388{,}000$$

c. The Angle, I found to lay the pipe in a southeast heading South is 34.9°. 19.50 miles of pipe across the private ground. 20.85 miles of pipe for East in the BLM ground to connect to the refinery. the cost will be $26,388,000. This is the least cost, I found.

d. $(x) = 480{,}000(32 - x) + 480{,}000\left(\sqrt{256+x^2}\right)$



Dr. CEO

Dr. CEO, I have came up with 4 routes, which we could lay these pipes to the refinery:

One route is going west, south and then East to the refinery.
This one, would go 100% through BLM ground, 64 miles of pipe. The cost is $30,720,000.

One other option is gonna run through the mountain and then south to the refinery
48 miles of the pipes would be the requirement. Drilling through the mountain would sky rock the price to about $ 28,940,000. This comes with extra cost.
Drilling the mountain $4,500,000
480,000 per mile x 48 miles
Impact study $600,000
8 months delay 100,000 x 8

I also calculated the cost of running the pipeline the shortest distance, which is through private ground, directly to the refinery. The cost came out to be $30,055,2000.

The best route I found was, running the pipe through the private ground and then through BLM ground. After doing all the calculations, it came out to be the least expensive.
The pipeline would go, southeast 34.87 degrees, 19.50 miles of pipe through the private ground. Then you need to lay about 20.85 miles of pipe due East to connect to the refinery. The whole thing would cost $26,388,000.