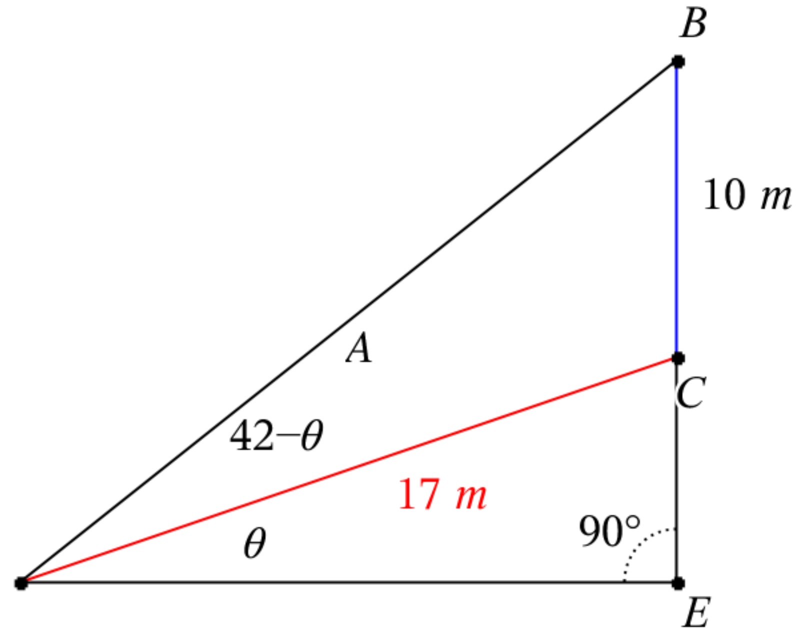
Given: See figure

m∠BAE =42°

Want: measure of θ

The key to this problem is m∠BAE =42° paired with the fact that triangle ABE is a right triangle

This tells us that M∠ABC =90−42 = 48



Given: See figure

$m\angle BAE = 42°$

We found $m\angle ABC = 90-42 = 48$

Now we can apply the law of sines to find the measure of angle BAC

$$\frac{\sin BAC}{10} = \frac{\sin(48)}{17}$$

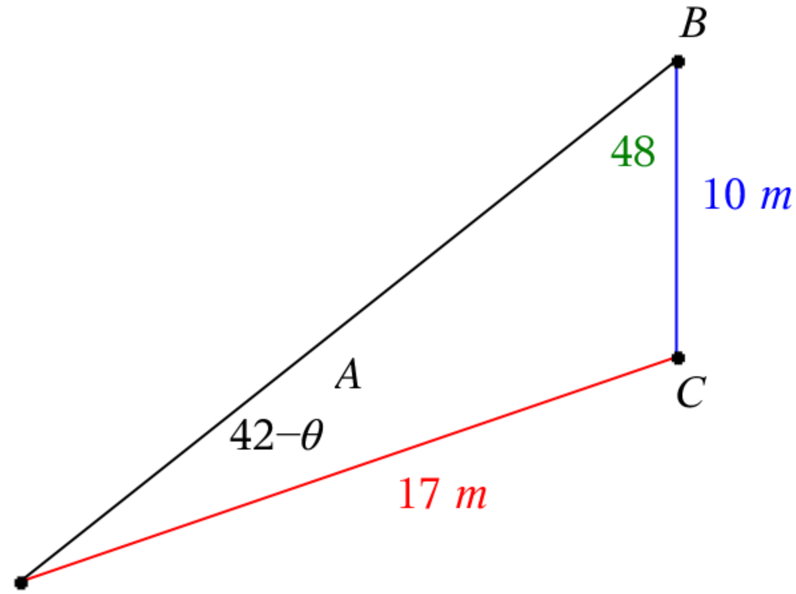
This leads to $\sin(BAC) = \frac{10\cdot \sin(48.)}{17}$

so $m\angle BAC = \arcsin\left(\frac{10\cdot \sin(48.)}{17}\right) \approx 25.9218$

Since $m\angle BAC = 42-\theta$ and

$m\angle BAC = 25.9218$

We can set them equal to each other and solve for θ



Given: See figure

$m\angle BAE = 42°$

We found $m\angle ABC = 90 - 42$

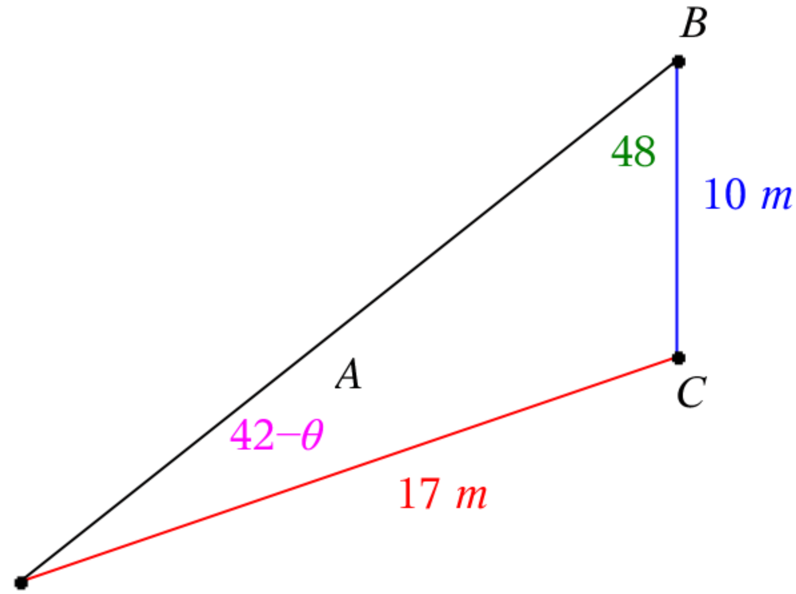
We found $m\angle BAC = 25.9218$

We can set them equal to each other and solve for θ

$42 - \theta = 25.9218$

$42 - 25.9218 = \theta$

$16.0782 = \theta$



Given: See figure

Want: Length of GD

NOTE: m∠XTG =74°

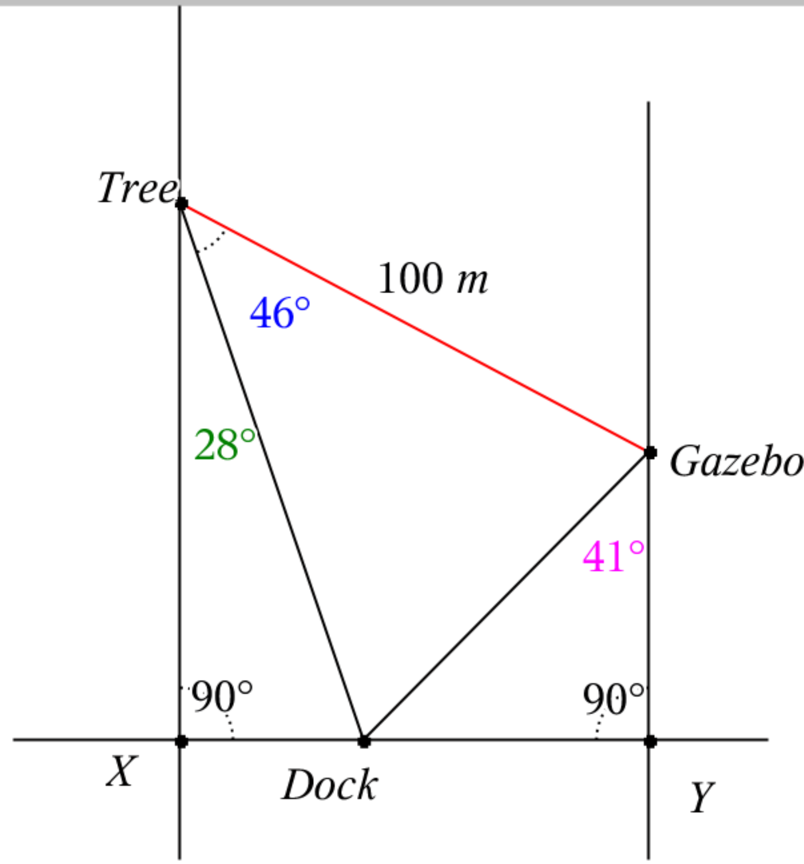
NOTE: m∠DTG = $74-28=46°$

We need to add lines to do this problem

Add a parallel through Dock

Extend perpendicular lines that headings (bearings) are drawn from

This should lead to all the triangle's angles so it should be easy to apply the law of sines to find GD



Given: See figure

Want: Length of GD

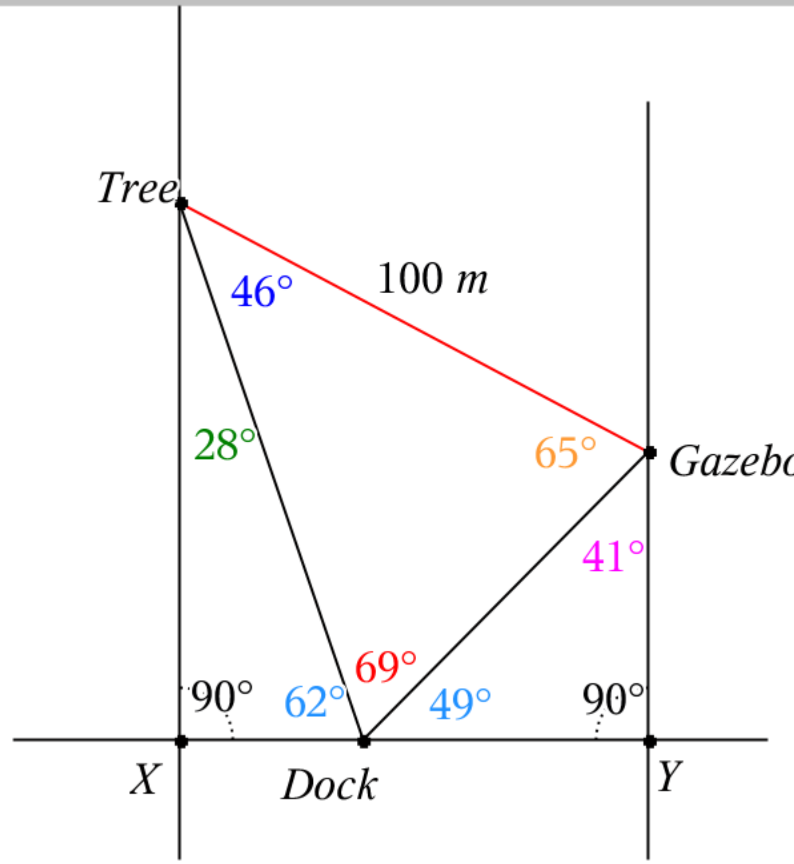
m∠TDX $=90-28$ ▸ 62

m∠GDY $=90-41$ ▸ 49

To find $m\angle TDG = 180-(62+49)$ ▸ 69

To find $m\angle DGT = 180-(69+46)$ ▸ 65

Now we can apply the law of sines



Given: See figure

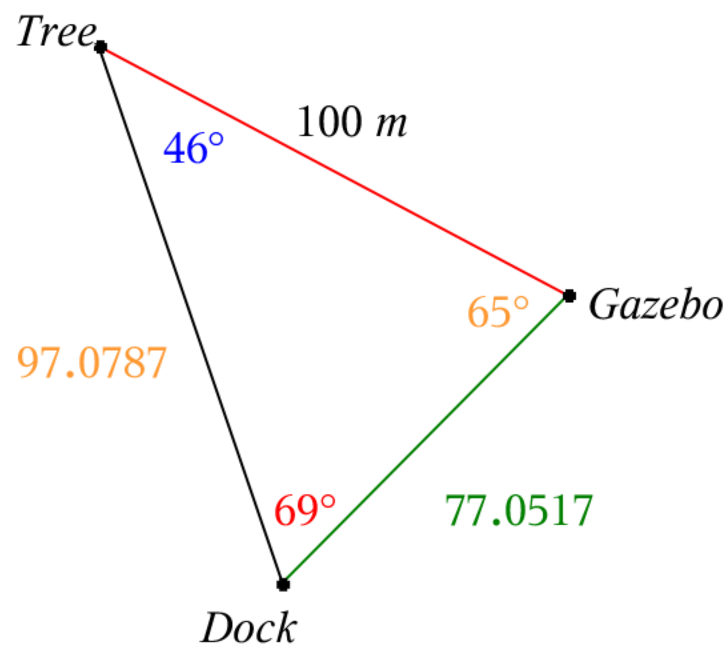
Want: Length of GD

$$\frac{GD}{\sin(46)}=\frac{100}{\sin(69)}$$

$$GD=\frac{100\cdot\sin(46)}{\sin(69.)}=77.0517$$

$$\frac{TD}{\sin(65)}=\frac{100}{\sin(69)}$$

$$TD=\frac{100\cdot\sin(65)}{\sin(69.)}=97.0787$$



SEE THE WORKED OUT SOLUTION FROM 2-27-17 Entry Slip

I thought this problem did lack some clarity in the given

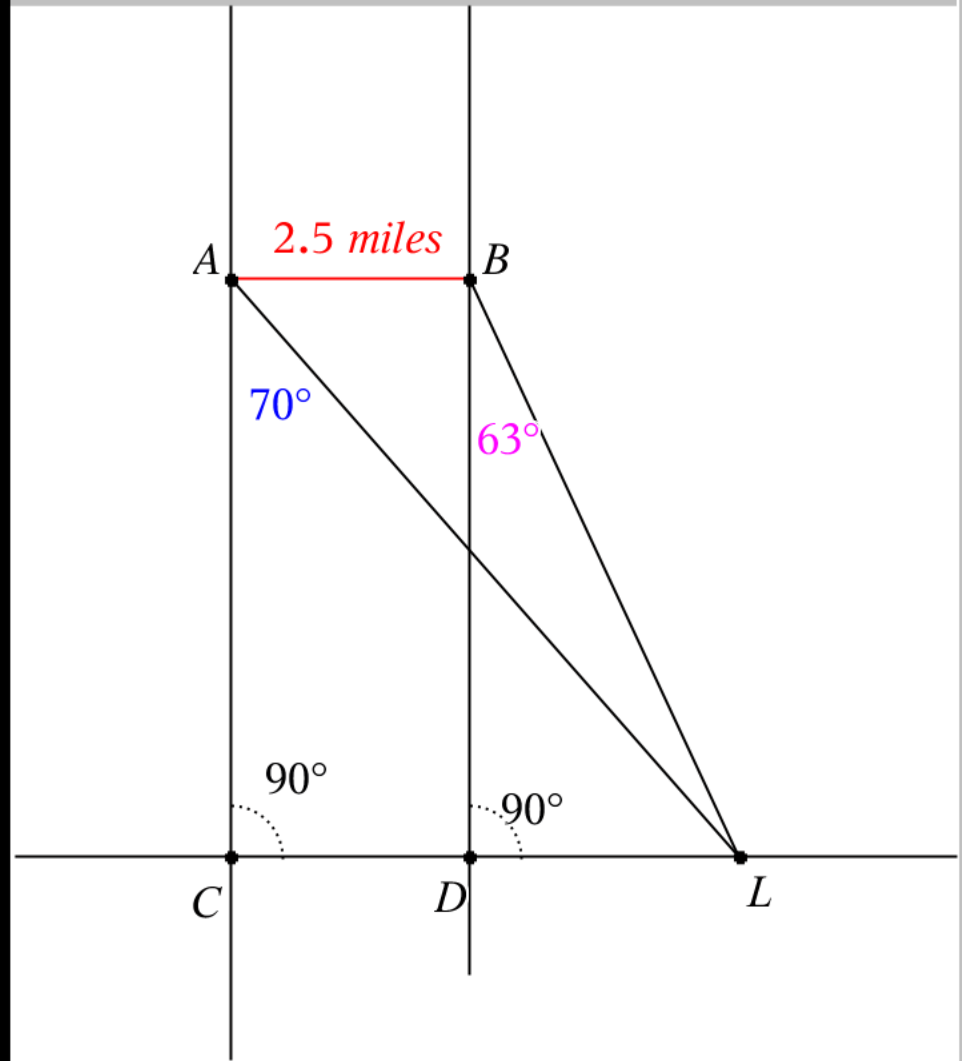
Given: See Figure

Want: length of shoreline (I assumed this was CL on my figure, but they did not make it very clear!)

We also know the rate from A to B was 10 mph, which they traveled for 15 minutes

$AB = 10 \cdot \frac{15.}{60} = 2.5$

We can find all of the angles pretty easily after this



Given: See Figure

We found AB= 2.5

$m\angle LAB = 90-70 \blacktriangleright 20$

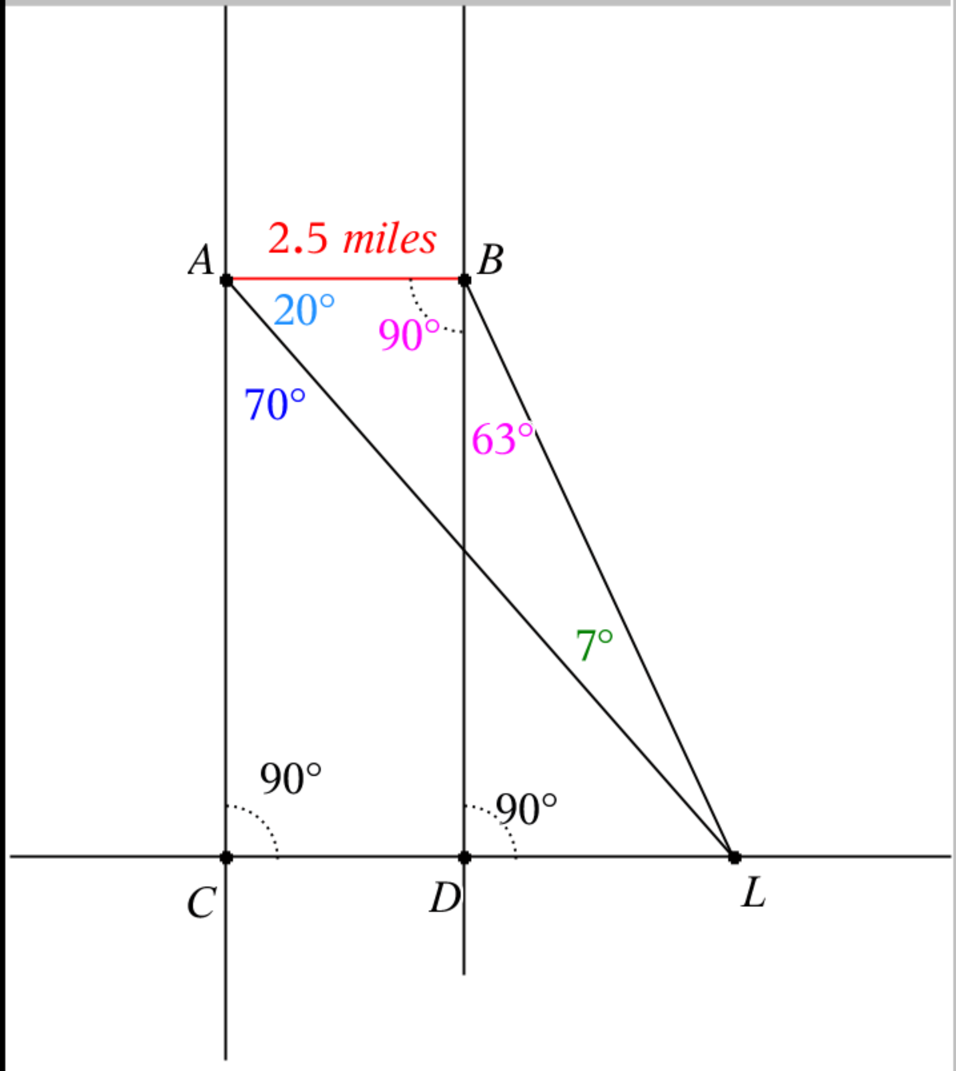
$m\angle ABL = 90+63 \blacktriangleright 153$

$m\angle ALB = 180-(153+20) \blacktriangleright 7$

Now to find the distance to the shoreline is another issue

I know their intent was the SHORTEST distance to the shoreline, which is BD, but I could see how a person could think they meant BL

I'll show both answers since they were not clear



Given: See Figure

We found AB= 2.5

m∠LAB $=90-70$

m∠ABL $=90+63$

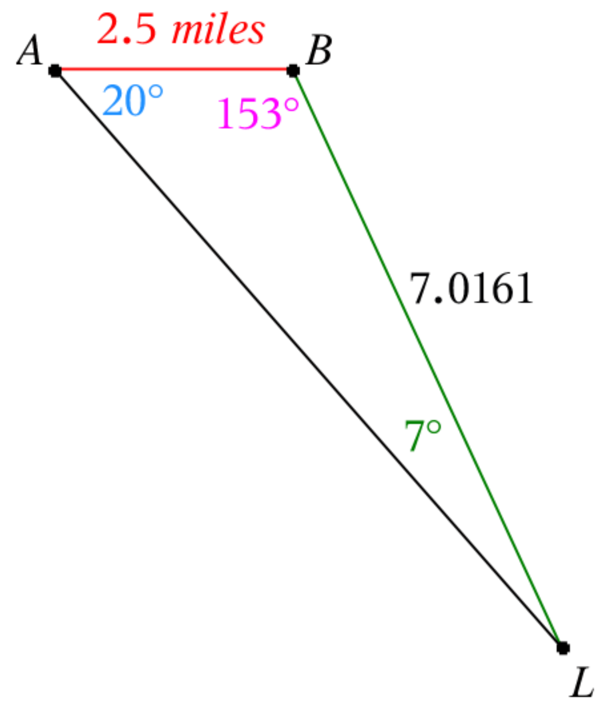
m∠ALB $=180-(153+20)$

We need BL

$$\frac{BL}{\sin(20)}=\frac{2.5}{\sin(7)}$$

$$BL=\frac{2.5\cdot\sin(20)}{\sin(7)}=7.01612$$

This is the as the crow flies distance to shoreline!



Given: See Figure

We found AB= 2.5

$m\angle LAB = 90 - 70$

$m\angle ABL = 90 + 63$

$m\angle ALB = 180 - (153 + 20)$

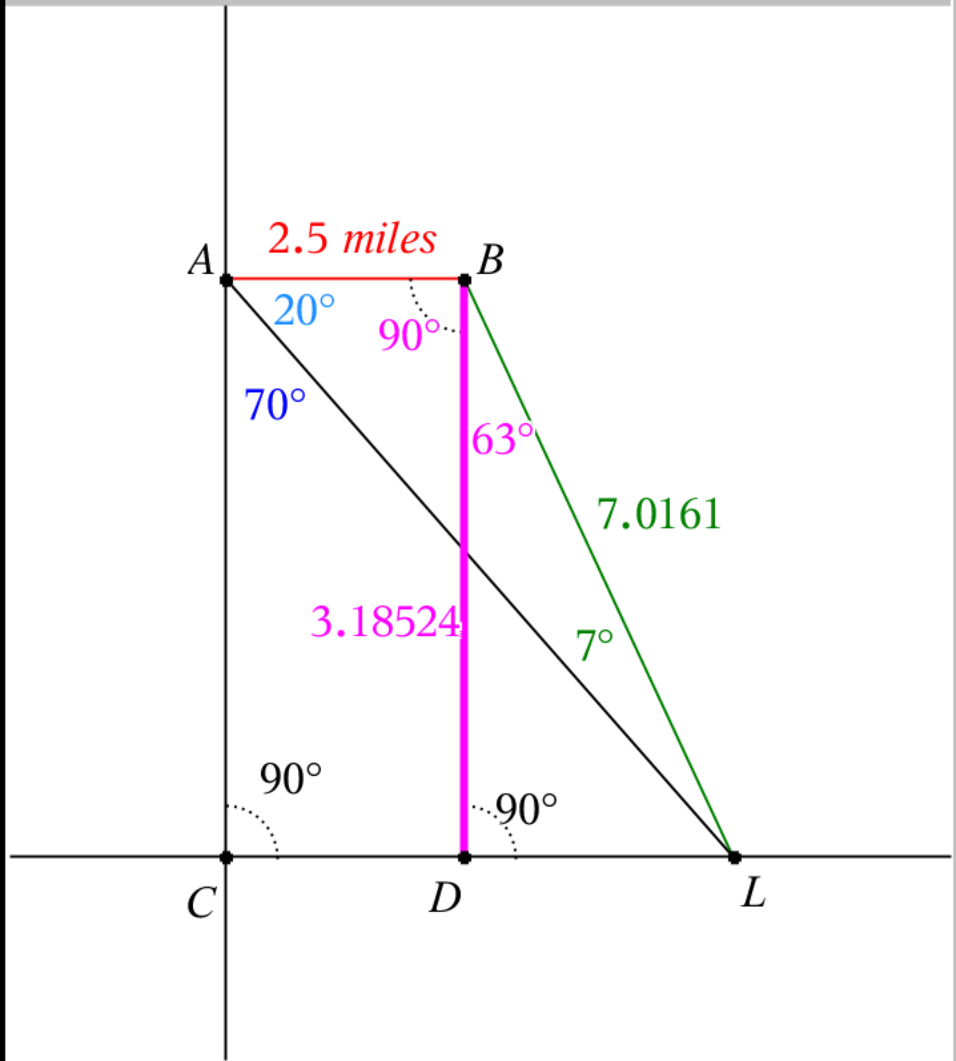
BL ≈7.016 miles

Now we can find the shortest distance to the shoreline

$$\cos(63) = \frac{BD}{7.0161}$$

$BD = 7.0161 \cdot \cos(63) \approx 3.18524$

This is the SHORTEST distance to the shoreline



This problem is one that has the potential as an extra credit type problem

Given: See figure

Want: d in terms of θ and Φ

While this is irritating to have the missing angles as variables, it is pretty straight forward

1) Find m∠PBA

$m\angle PBA = 180 - \Phi$

2) Find m∠APB

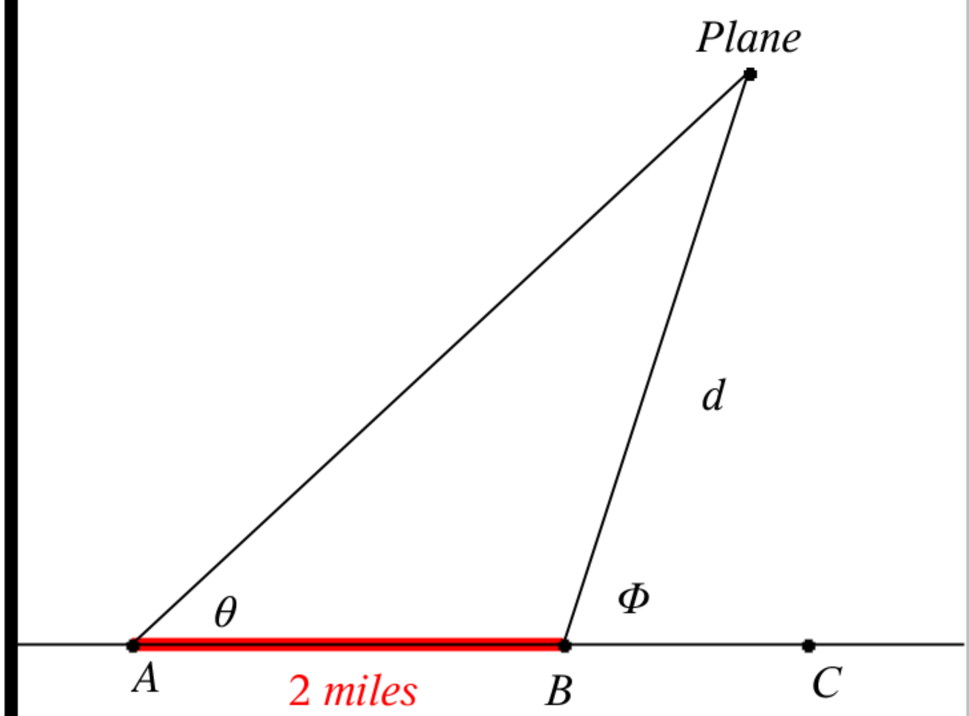
$m\angle APB = 180 - (180 - \Phi + \theta)$

$= 180 - 180 + \Phi - \theta$

$= \Phi - \theta$

3) Apply law of sines

See next page



This problem is one that has the potential as an extra credit type problem

Given: See figure

Want: d in terms of θ and Φ

1) Find $m\angle PBA$

$m\angle PBA = 180 - \Phi$

2) Find $m\angle APB$

$m\angle APB = 180 - (180 - \Phi + \theta)$

$= 180 - 180 + \Phi - \theta$

$= \Phi - \theta$

3) Apply law of sines

$$\frac{2}{\sin(\Phi-\theta)} = \frac{\mathbf{d}}{\sin(\theta)}$$

$$d = \frac{2\cdot\sin(\theta)}{\sin(\Phi-\theta)}$$