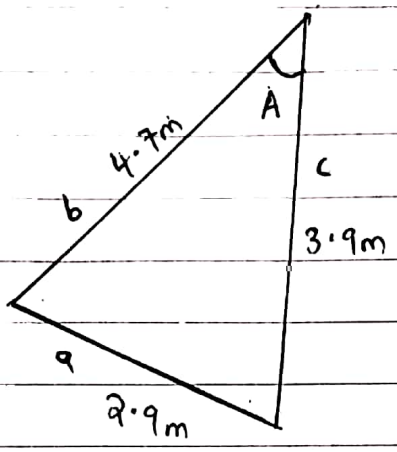
Question 1.



$a = 2.9\,m$

$b = 4.7\,m$

$c = 3.9\,m.$

Cosine Rule

$$a^2 = b^2 + c^2 - 2bc\cos(A)$$

Make $\cos(A)$ the subject.

$$\frac{-2bc\cos(A)}{-2bc} = \frac{-b^2 - c^2 + a^2}{-2bc}$$

$$\cos(A) = \frac{b^2 + c^2 - a^2}{2bc}$$

Therefore $\therefore \cos(A) = \frac{4.7^2 + 3.9^2 - 2.9^2}{2 \times 4.7 \times 3.9}$

$$\therefore \cos(A) = \frac{28.89}{36.66}$$

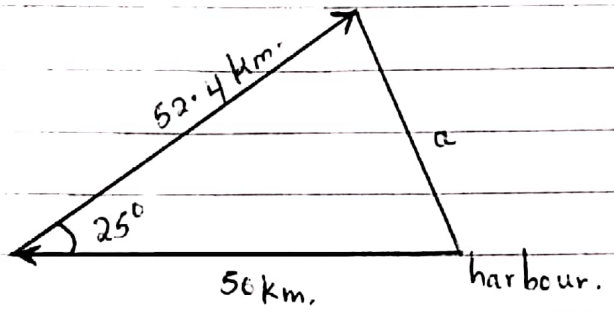
Inverse of cos $\therefore \cos(A)^{-1} \frac{28.89}{36.66}$

$$\therefore = 37.99612655989. = 37.99 = 38$$

To the nearest degree $= 38°$

Ans $\angle A = 38°$

Question 2.



Cosine Rule = $a^2 = b^2 + c^2 - 2bc \cos A$.

$a = ?$

$b = 52.4km$

$c = 50km$

$\angle A = 25^\circ$

$a^2 = (52.4)^2 + (50)^2 - 2 \times 52.4 \times 50 \cos 25^\circ$.

$\therefore a^2 = 2745.76 + 2500 - 4749.05$

$5245.76 - 4749.05$

$\therefore a^2 = 496.71$

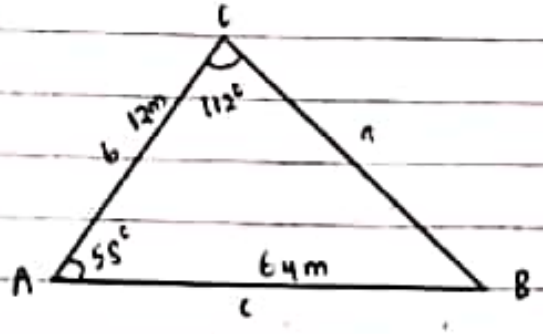
$\therefore = \sqrt{a^2} = \sqrt{496.71}$

$a = 22.286$

$a = 22.286$ to the nearest tenth.

Ans:. $a = 22.3$.

Question 3.



$a^2 = b^2 + c^2 - 2bc \cos A.$

$a = ?$

$b = 12m$

$c = 64m.$

$A = 58^c$

$a^2 = b^2 + c^2 - 2bc \cos A.$

$a^2 = (12)^2 + (64)^2 - 2 \times 12 \times 64 \cos 58^0$

$a^2 = 144 + 4096 - 813.96$

$a^2 = 4240 - 813.96$

$a^2 = \cancel{3414.26}$ 3426.04.

$a = \sqrt{3426.04}$

$a = 58.53$ to the nearest tenth.

Ans = $a = 58.5$ m.

Question 4.

Cosine Rule = $a^2 = b^2 + c^2 - 2bc \cos A$.

To get the angle $\angle B$ the rule becomes:

$\therefore \quad b^2 = a^2 + c^2 - 2ac \cos B$.

$-2ac \cos B = -a^2 - c^2 + b^2$.

Make $\cos B$ the subject.

$$\frac{-2ac \cos B}{-2ac} = \frac{-a^2 - c^2 + b^2}{-2ac}$$

$$\cos B = \frac{-(a^2 + c^2 - b^2)}{-(2ac)}$$ ∴ the negatives cancel.

$$\cos B = \frac{a^2 + c^2 - b^2}{2ac}$$

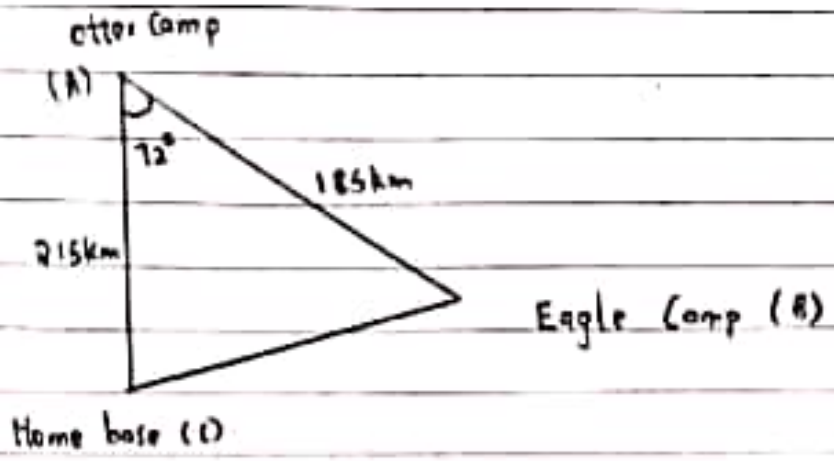
To find $\angle B$ then we convert cosine to cos inverse cos

Therefore $\angle B = \cos^{-1}\left(\frac{a^2 + c^2 - b^2}{2ac}\right)$

hence the answer is option a. where

$$B = \cos^{-1}\left(\frac{a^2 + c^2 - b^2}{2ac}\right)$$

Question 5.



let A B and C represent otter camp, Eagle camp and Home base respectively.

Cosine rule:

$$a^2 = b^2 + c^2 - 2bc\cos A.$$

a = ?

b = 215km

c = 185km

$$a^2 = (215)^2 + (185)^2 - 2 \times 215 \times 185 \cos 72^\circ$$

$$a^2 = 46225 + 34225 - 24582.30$$

$$a^2 = 80450 - 24582.30$$

$$a^2 = 55867.7$$

$$a = \sqrt{55867.7}$$

$$a = 236.36$$

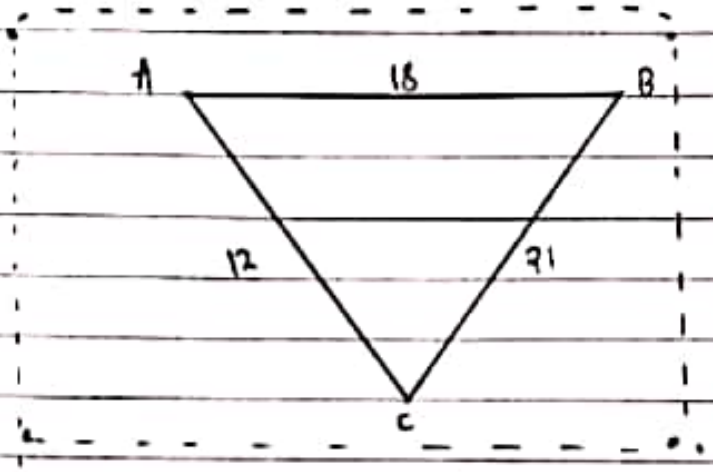
Total distance is given by: a + b + c

Therefore

T. Distance: = 236.36 + 215 + 185. = 636.36. to the nearest km

= 636km.

Question 1



Cosine rule:

$a^2 = b^2 + c^2 - 2bc\cos A.$

$a = 21$

$b = 12$

$c = 18$

$(21)^2 = (12)^2 + (18)^2 - 2 \times 21 \times 12 \cos A.$

$441 = 468 - 504\cos A.$

$441 - 468 = -504\cos A.$

$-27 = -504\cos A.$

~~$\cos A = 504$~~

$\cos A = \frac{27}{504}$ = $A = \cos^{-1}\frac{27}{504}$

$A = \angle A = 86.929°$ to the nearest degree.

$\angle A = = 87°$

$= b^2 = a^2 + c^2 - 2ac\cos B.$

$= (12)^2 = (21)^2 + (18)^2 - 2 \times 21 \times 18 \cos B$

$144 = 441 + 324 - 756\cos B.$

$144 = 765 - 756\cos B.$

$144 - 765 = -756\cos B.$

$-621 = -756\cos B$

Cont. Question 6.

$\cos B = \frac{621}{756}$ Make cos to inverse cos ($\cos^{-1}$)

$B = \cos^{-1} \frac{621}{756}$

$= 34.771944039\overline{5}$ to the nearest whole degre

Ans. $\angle B = 35^\circ$

Angles inside the triangle add upto 180°

therefore :

$\angle A + \angle B + \angle C = 180^\circ$

$81^\circ + 35^\circ + \angle C = 180$

$122 + \angle C = 180^\circ$

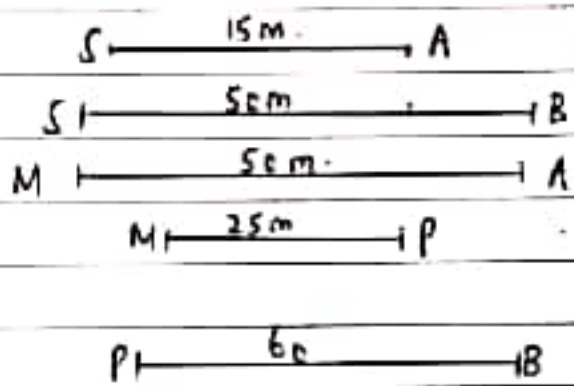
$\angle C = (180 - 122)^\circ$

$\angle C = 58^\circ$

Question 7 (seven).

let

S represent Sandra
A represent Adam
M represent Melissa
P represent Peter
B represent Bill.



Melissa is leading
Peter is the second
Sandra is the third
Adam is the fourth.
Bill is the fifth.

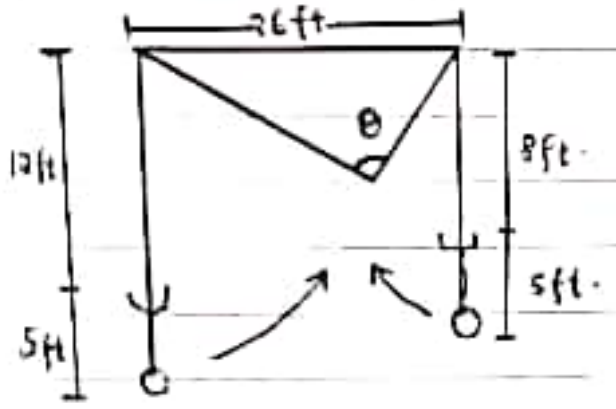
Distance between Melissa and peter is 25m.

Distance between Peter and Sandra is 50-(25+15) = 10m

Distance between Sandra and Adam is 15m.

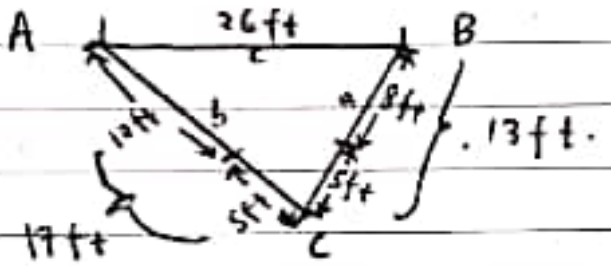
Distance between Adam and Bill is 50-15 = 35m.

Question 5:



$a^2 = b^2 + c^2 - 2bc\cos A$.

Picture on how they meet.



$a = 13ft$.

$b = 17ft$.

$c = 26ft$.

To get $\angle C$ we use cosine Rule where

$$c^2 = a^2 + b^2 - 2ab\cos C.$$

$$(26)^2 = (13)^2 + (17)^2 - 2 \times 13 \times 17 \cos C.$$

$$676 = 169 + 289 - 442\cos C.$$

$$676 = 458 - 442\cos C.$$

$$676 - 458 = -442\cos C$$

$$218 = -442\cos C.$$

$$\cos C = \frac{218}{442} \quad \angle C = \cos^{-1}\frac{218}{442}$$

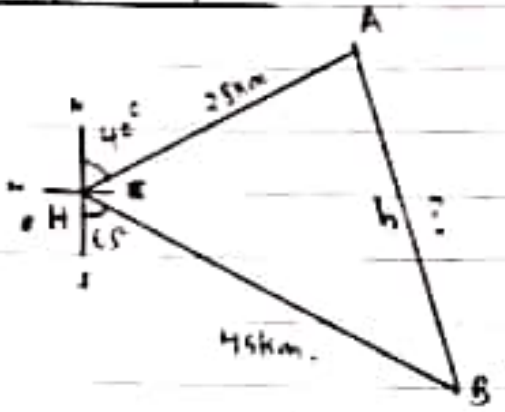
$$\angle C = 119.551^\circ$$

To the nearest degree the two trapzeo meet at

~~120°~~ 120°

Ans = 120°

Question 9.



Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$.

$$h^2 = b^2 + c^2 - 2bc\cos H.$$

$h = ?$

$a = 45\text{km}.$

$b = 28\text{km}.$

$H =$

to get H. you add outer angles at H.

That is $40 + 65 = \underline{105^\circ}$

These angles lies on a straight line where the sum is 180°

Therefore the inner angle is $(180^\circ - 105) = \underline{75^\circ}$

$H = 75^\circ$

Therefore :

$$h^2 = (45)^2 + (28)^2 - 2 \times 45 \times 28 \cos 75^\circ$$

$$h^2 = 2025 + 784 - 652.223$$

$$h^2 = 2809 - 652.223$$

$$h^2 = 2156.777$$

$$h = \sqrt{2156.777}$$

$h = \underline{46.441}$ to the nearest 1 d.p

Ans : $\underline{h = 46.4\text{ km}}$