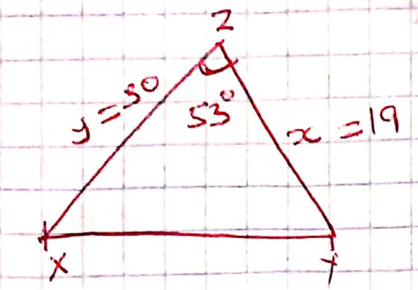
(solution)

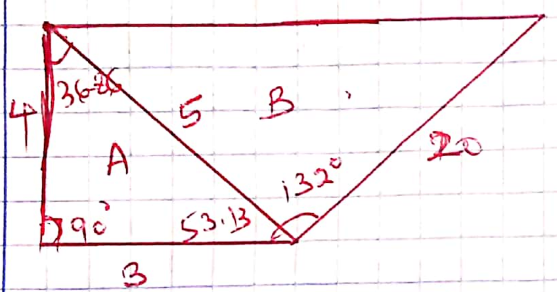
$\{ \text{Area} = \frac{1}{2} ab \sin c \}$

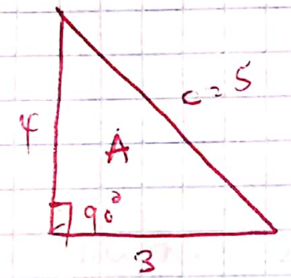
① 

$A = \frac{1}{2} xy \sin Z$

$= \frac{1}{2} \times 30 \times 19 \sin 53°$

$= 227.61$ square units

② 



Using pythagoras theorem we find the hypotenuse of Triangle A

$c^2 = 4^2 + 3^2$

$c^2 = 16 + 9$

$c = \sqrt{16+9}$

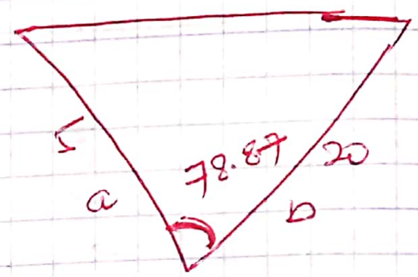
$c = 5$

∴ The area of Triangle A

$= \frac{1}{2} bh$

$= \frac{1}{2} \times 3 \times 4 = 6$ square units

And since hypotenuse of Triangle A is a common side for both Triangle A and B We can also solve the area of B as follows.



$\tan \theta = 4/3$

$\theta = \tan^{-1}(4/3)$

$= 53.130$

$132 - 53.13$

$= 78.87°$

$\text{Area} = \frac{1}{2} ab \sin c$

$= \frac{1}{2} \times 5 \times 20 \sin 78.87°$

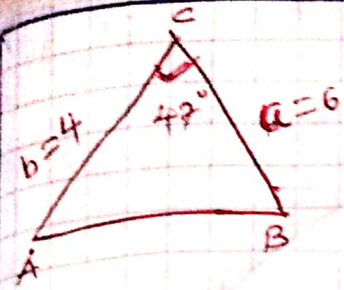
$= 49.06$ square units

=> Total are of Quadrilateral

$= A + B$

$= 6$ square units $+ 49.06$ square units

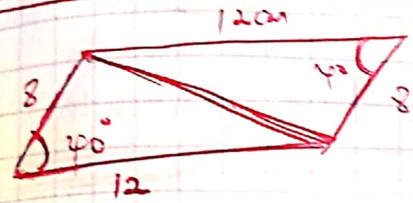
$= 55.06$ square units



$\Rightarrow$ Area $= \frac{1}{2} ab \sin c$

$= \frac{1}{2} \times 6 \times 4 \sin 47°$

$= 8.776$ square units

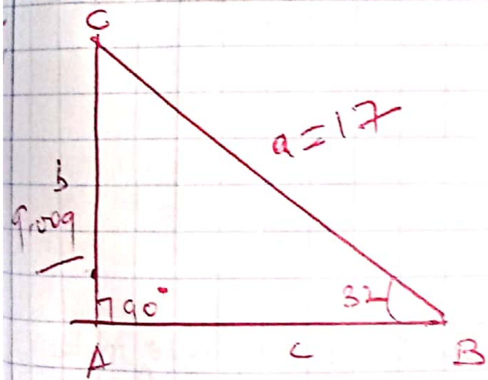


$\left\{ \text{Area} = \frac{1}{2} ab \sin c \times 2 \right\}$

$= \frac{1}{2} \times 12 \times 8 \sin 40 \times \cancel{2}$

$= 96 \sin 40$

$= 61.71$ square units



SOHCAHTOA

$\sin\theta = \frac{\text{opposite}}{\text{hypotenue}}$

$\sin 32 = \frac{b}{17}$

$\Rightarrow b = 17 \sin 32$

$= 9.009$

$\cos 32 = \frac{c}{a}$

$\cos 32 = \frac{c}{17}$

$c = 17 \cos 32$

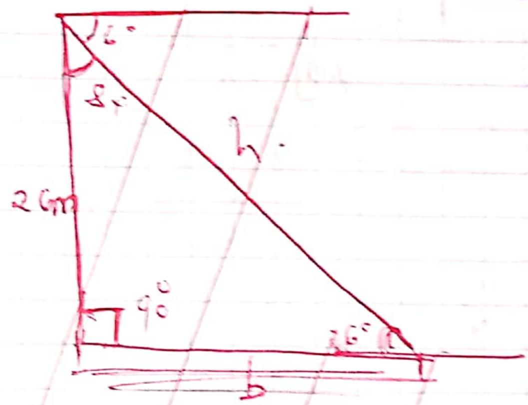
$= 14.42$

$A = \frac{1}{2} \times 17 \times 14.42 \sin 32$

$= \cancel{82.075 \text{ square units}}$

$A = 64.95$ square units

6.



$\cos 84 = \frac{26}{hyp}$

$hyp \cos 84 = 26$

$hyp = \frac{26}{\cos 84}$

248.736

$\boxed{\sin 6° = \frac{26}{}}$

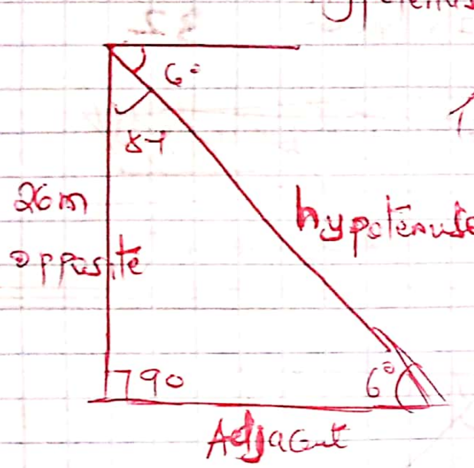
$\tan 6° = \frac{26}{b}$

247.373

6 $Tan = \frac{opposite}{Adjacent}$

$Sin = \frac{opposite}{Hypotenuse}$

$Cos = \frac{Adjacent}{Hypotenuse}$



$Tan\ 8P = \frac{x}{26}$

$Tan\ 6° = \frac{opposite}{Adjacent}$

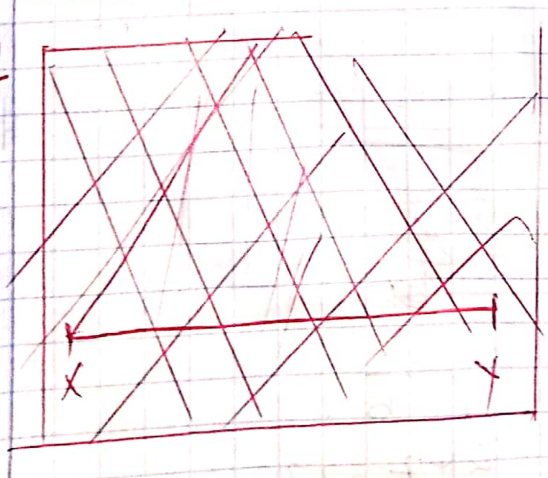
$Tan\ 6° = \frac{26}{Adjacent}$

$Adj\ Tan6° = 26$

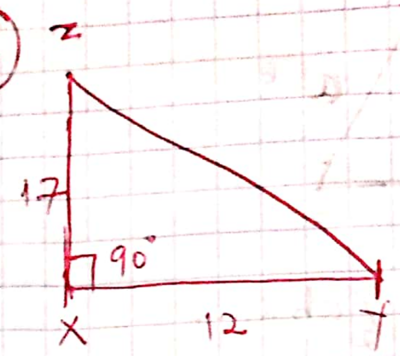
$Adj = \frac{26}{Tan6}$

$Adj = 247.37m$

7



7

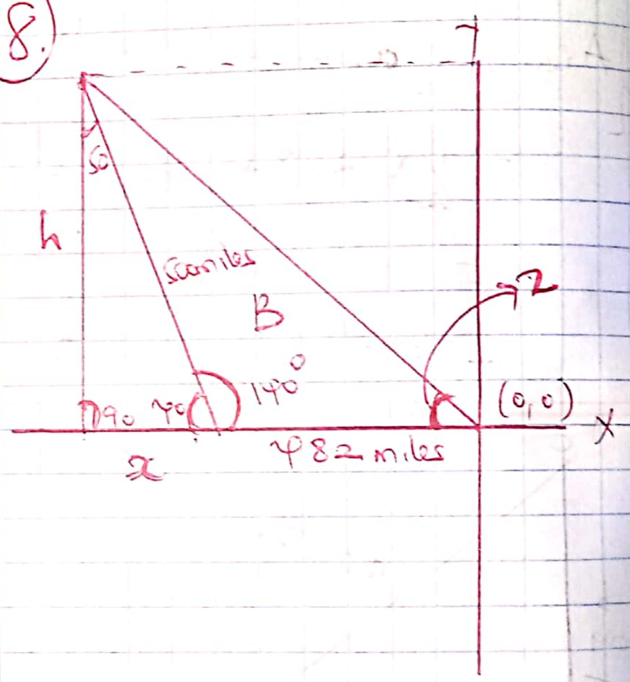


$Area = \frac{1}{2}bh$

$= \frac{1}{2} \times 12 \times 17$

$= 102$ squareunits

8



(i) Amount of square miles that was covered.

Area of B from the figure above

$A = \frac{1}{2}ab\sin c$

$A = \frac{1}{2} \times 482 \times 500 \sin 140$

$= 77455.91$ square miles

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

let first by finding h.

$h^2 = 500^2 - x^2$

$h = \sqrt{500^2 - x^2}$

$h = \sqrt{250000 - x^2} \quad \ldots (1)$

Recall also

$\tan\theta = h/x$.

$\tan 40^\circ = \frac{h}{x}$.

$h = x \tan 40 \quad \ldots (11)$

equating (1) and (11)

$(x \tan 40)^2 = \left(\sqrt{250000 - x^2}\right)^2$

$(x \tan 40)^2 = 250000 - x^2$.

$0.704088191 x^2 = 250{,}000 - x^2$

$0.704088191 x^2 + x^2 = 250{,}000$

$1.704088191 x^2 = 250{,}000$

$x^2 = \frac{250{,}000}{1.704088191}$

$x^2 = 146706.0222$

$x = 383.0222216$

$\Rightarrow h = 383.0222216 \tan 40$

$= 321.3938048$.

$\Rightarrow d =$

$x_1 = 0$

$x_2 = 482 + 383.02$

$= 865.02$

$y_1 = 0$

$y_2 = 321.39$

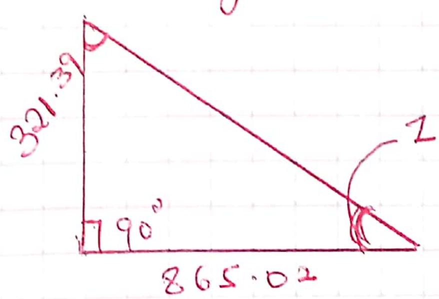
$\therefore d = \sqrt{(865.02 - 0)^2 + (321.39 - 0)^2}$

$= \sqrt{865.02^2 + 321.39^2}$

$= 922.795282$

≈ 922.80 miles

(ii) Amount of degrees of the angle that is formed between the ships original path and its final path back to the origin.



$\tan z = \frac{\text{opposite}}{\text{Adjacent}}$

$\Rightarrow \tan z = \frac{321.39}{865.02} = 0.37154058$

$z = \tan^{-1}(0.371540524)$

$z = 20.38^\circ$