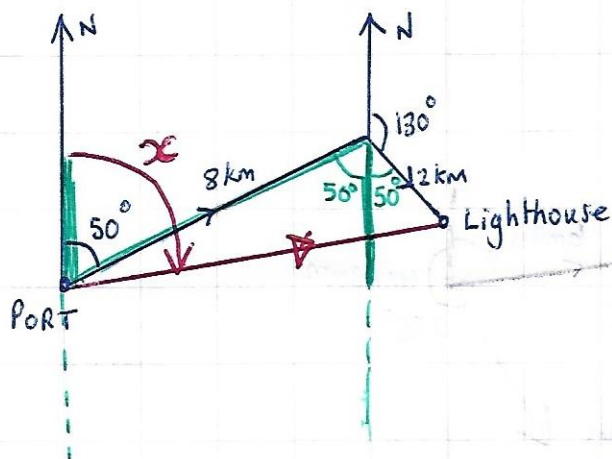


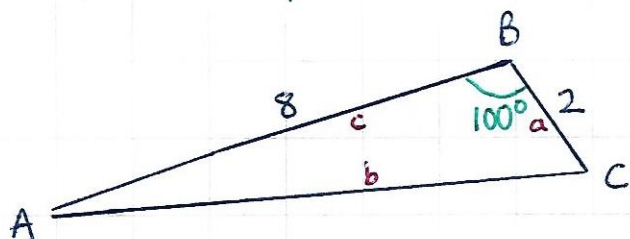
Year 10 Trig/Bearings Answers

1)

a)



b)



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

$$Ac^2 = 2^2 + 8^2 - 2(2)(8) \cos 100^\circ$$

$$Ac^2 = 4 + 64 - 32 \cos 100^\circ$$

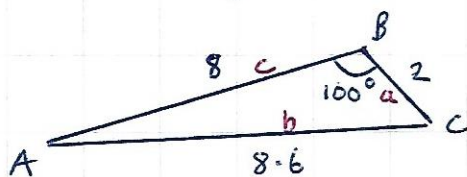
$$Ac^2 = 68 - (-5.557)$$

$$Ac^2 = 68 + 5.557$$

$$Ac^2 = 73.557$$

$$Ac = 8.6 \text{ km}$$

c) Need to find x



First find $\hat{A}$.

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{2}{\sin A} = \frac{8.6}{\sin 100^\circ}$$

$$\frac{\sin A}{2} = \frac{\sin 100^\circ}{8.6}$$

$$\sin A = \frac{2 \sin 100^\circ}{8.6}$$

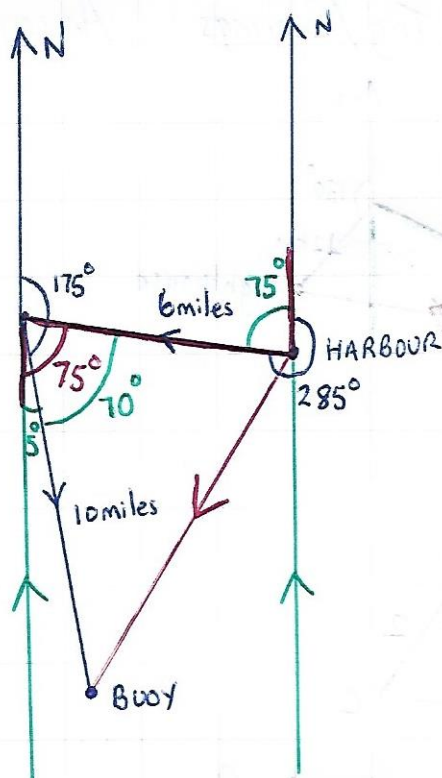
$$\sin A = 0.229$$

$$A = 13.2^\circ$$

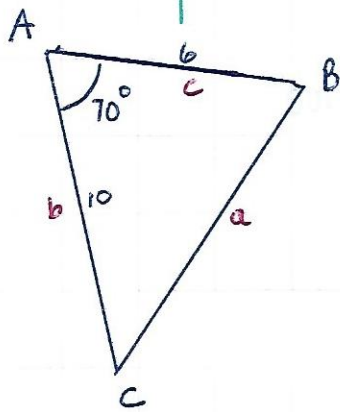
$$\therefore x = 50^\circ + 13.2^\circ = 63.2^\circ$$

$\therefore$ Bearing needed
 $\approx 063^\circ$

2) a)



b)



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

$$BC^2 = 10^2 + 6^2 - 2(10)(6) \cos 70^\circ$$

$$BC^2 = 100 + 36 - 120 \cos 70^\circ$$

$$BC^2 = 136 - (41.04)$$

$$BC^2 = 94.96$$

$$\underline{\underline{BC = 9.7 \text{ miles}}}$$

c)

$$S = \frac{D}{T}$$

$$22 = \frac{9.7}{T}$$

$\times T$

$$22T = 9.7$$

$$T = \frac{9.7}{22}$$

$$T = 0.44 \text{ hours}$$

$$T = 0.44 \times 60 \text{ mins}$$

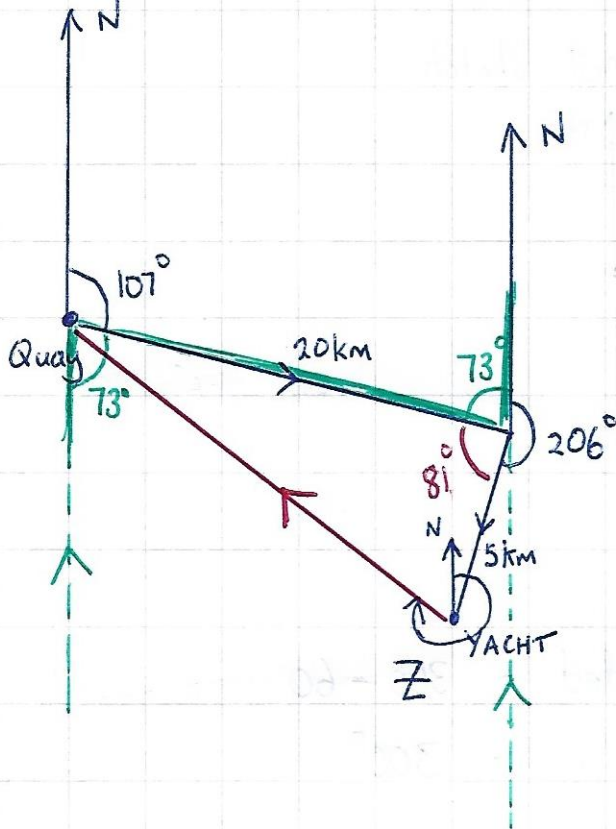
$$T = 26.45 \text{ mins}$$

$$T = 26 \text{ min } 27 \text{ secs.}$$

$$0.45 \times 60 \text{ secs}$$

$$= 27 \text{ secs}$$

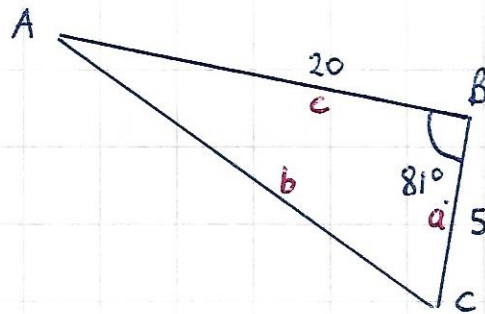
3) a)



$$206 + 73 = 279^\circ$$

$$360 - 279 = 81^\circ$$

b)



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

$$AC^2 = 5^2 + 20^2 - 2(5)(20) \cos 81^\circ$$

$$AC^2 = 25 + 400 - 200 \cos 81^\circ$$

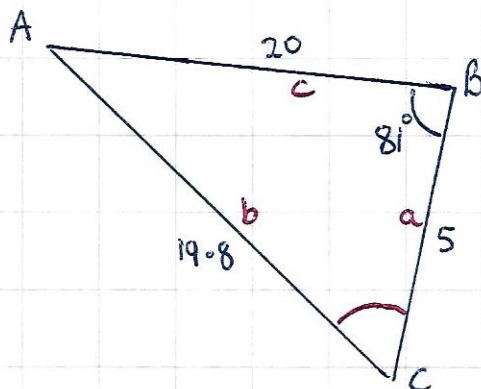
$$AC^2 = 425 - (31.29)$$

$$AC^2 = 393.71$$

$$AC = 19.8 \text{ km}$$

* HARD

c)



Calculate $\hat{C}$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

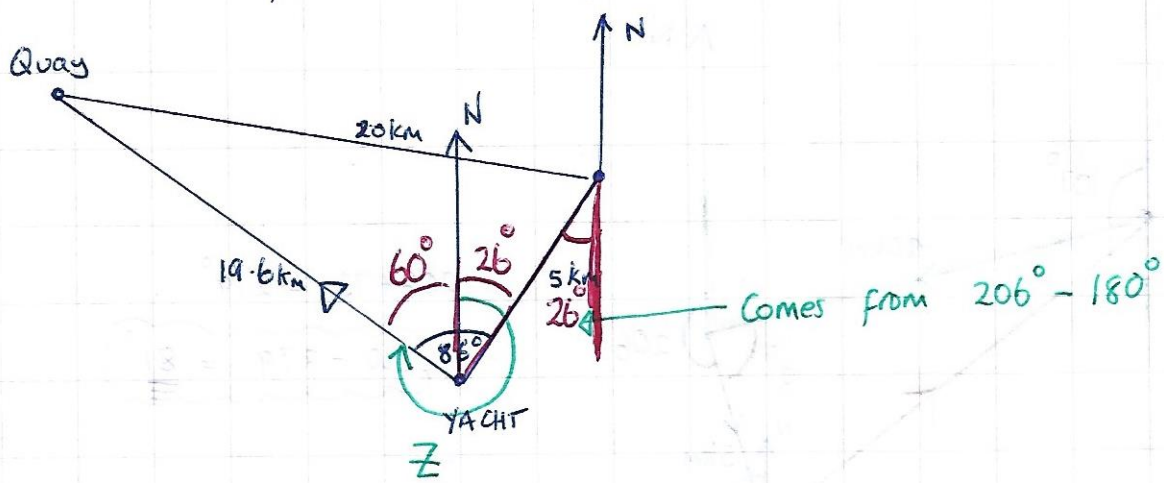
$$\frac{5}{\sin A} = \frac{19.8}{\sin 81^\circ} = \frac{20}{\sin C}$$

$$\frac{\sin 81^\circ}{19.8} = \frac{\sin C}{20}$$

$$0.998 = \frac{20 \sin 81^\circ}{19.8} = \sin C$$

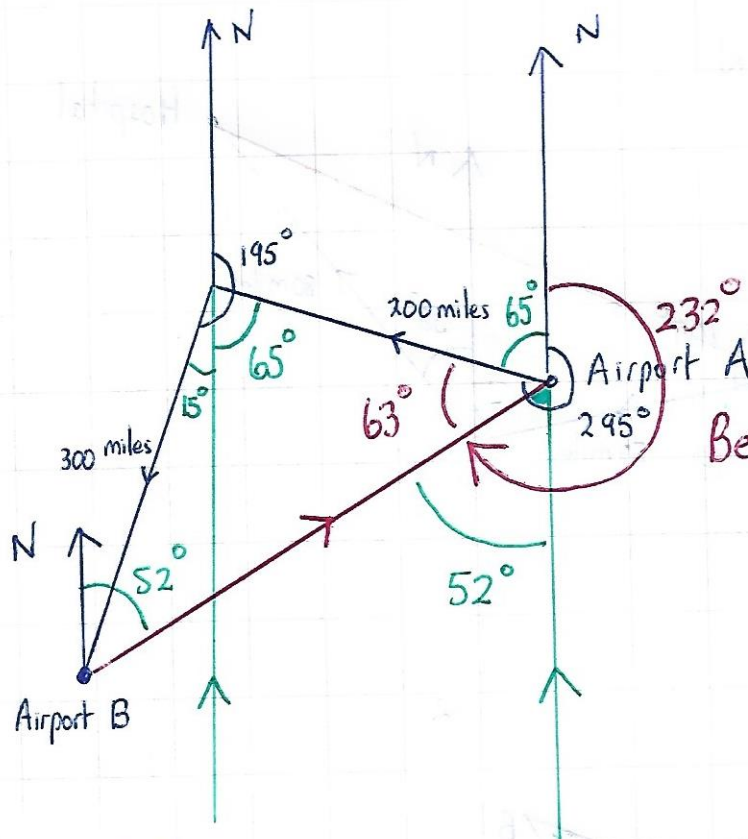
$$C = 86.1^\circ$$

Now find $\hat{Z}$ in first sketch.



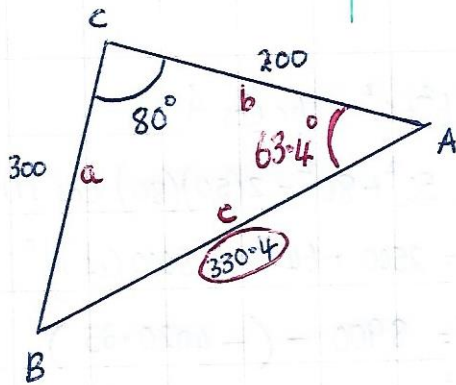
$$\begin{aligned} \text{bearing needed} &= 360 - 60 \\ &= 300^\circ \end{aligned}$$

4) a)



$$\begin{aligned} \text{Bearing A to B} &= 295 - 63 \\ &= 232^\circ \end{aligned}$$

b)



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

$$\begin{aligned} AB^2 &= 300^2 + 200^2 - 2(300)(200) \cos 80^\circ \\ AB^2 &= 90000 + 40000 - 120000 \cos 80^\circ \end{aligned}$$

$$AB^2 = 130000 - (20837.8)$$

$$AB^2 = 109162.2$$

$$AB = 330.4 \text{ miles.}$$

HARD

c) In triangle above calculate $\hat{A}$.

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{300}{\sin A} = \frac{200}{\sin B} = \frac{330.4}{\sin 80^\circ}$$

$$\frac{\sin A}{300} = \frac{\sin 80^\circ}{330.4}$$

$$\sin A = \frac{300 \sin 80^\circ}{330.4}$$

$$\sin A = 0.894$$

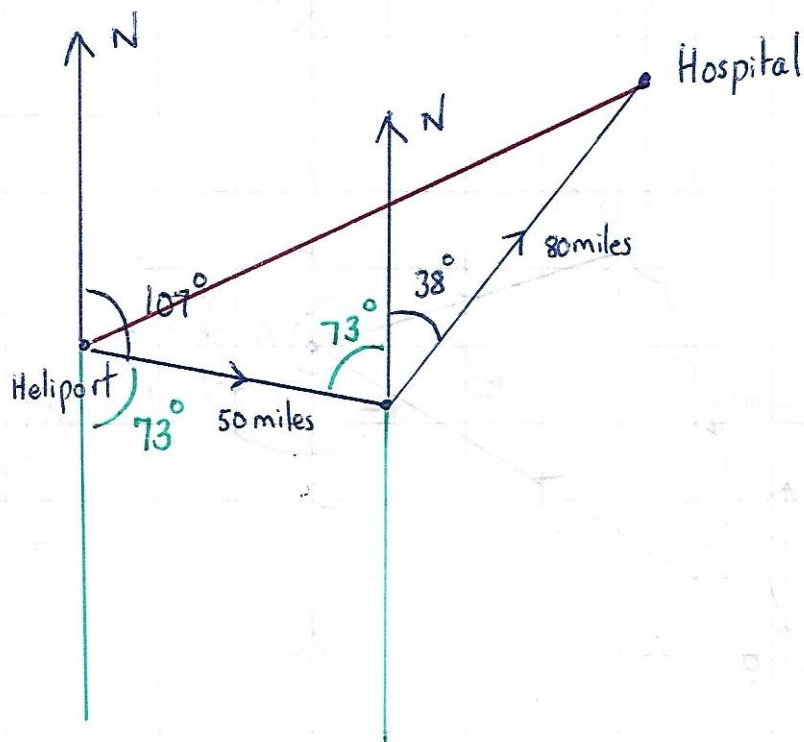
$$\hat{A} = 63.4^\circ$$

∴ Bearing needed from sketch

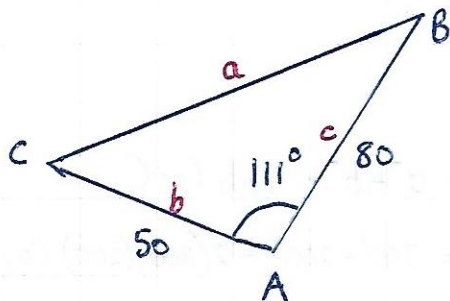
$$052^\circ$$

5)

a)



b)



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

$$BC^2 = 50^2 + 80^2 - 2(50)(80) \cos 111^\circ$$

$$BC^2 = 2500 + 6400 - 8000 \cos 111^\circ$$

$$BC^2 = 8900 - (-4020.35)$$

$$BC^2 = 8900 + 4020.35$$

$$BC^2 = 12920.35$$

$$\underline{BC = 113.7 \text{ miles}}$$

c)

$$S = \frac{D}{T}$$

$$110 = \frac{113.7}{T}$$

$$110T = 113.7$$

$$T = \frac{113.7}{110}$$

$$T = 1.034 \text{ Hours}$$

$$T = 1 \text{ hr } 2 \text{ mins.}$$

$$0.034 \times 60 \text{ mins}$$

$$= 2.04 \text{ mins}$$