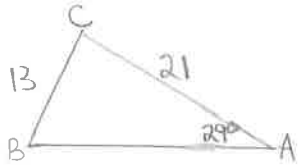
AMBIGUOUS CASE of SINE
WORKSHEET SOLUTIONS

① Case 1



$$\frac{13}{\sin 29} = \frac{21}{\sin B}$$

$$\sin B = \frac{21 \sin 29}{13}$$

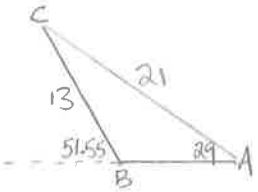
$$\angle B = 51.55^\circ$$

$$\angle C = 180 - 29 - 51.55$$
$$= 99.45^\circ$$

$$\frac{c}{\sin 99.45} = \frac{13}{\sin 29}$$

$$c = 26.45 \text{ cm}$$

Case 2



$$\angle B = 180 - 51.55$$
$$= 128.45^\circ$$

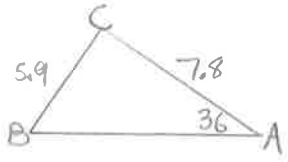
$$\angle C = 180 - 29 - 128.45$$
$$= 22.55^\circ$$

$$\frac{13}{\sin 29} = \frac{c}{\sin 22.55}$$

$$c = \frac{13 \sin 22.5}{\sin 29}$$

$$c = 10.26 \text{ cm}$$

② Case 1



$$\frac{5.9}{\sin 36} = \frac{7.8}{\sin B}$$

$$\sin B = \frac{7.8 \sin 36}{5.9}$$

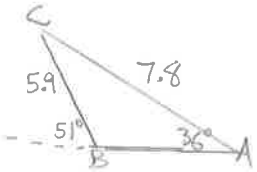
$$\angle B = 51^\circ$$

$$\angle C = 180 - 36 - 51$$
$$= 93^\circ$$

$$\frac{c}{\sin 93} = \frac{5.9}{\sin 36}$$

$$c = 10.0 \text{ m}$$

Case 2



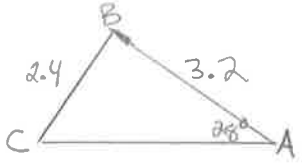
$$\angle B = 180 - 51$$
$$= 129^\circ$$

$$\angle C = 180 - 36 - 129$$
$$= 15^\circ$$

$$\frac{c}{\sin 15} = \frac{5.9}{\sin 36}$$

$$c = 2.6 \text{ m}$$

(3) Case 1



$$\frac{2.4}{\sin 28} = \frac{3.2}{\sin C}$$

$$\sin C = \frac{3.2 \sin 28}{2.4}$$

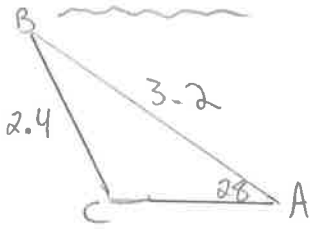
$$\angle C = 38.75^\circ$$

$$\angle B = 180 - 28 - 38.75$$
$$= 113.25^\circ$$

$$\frac{b}{\sin 113.25} = \frac{2.4}{\sin 28}$$

$$b = 4.7 \text{ cm}$$

Case 2



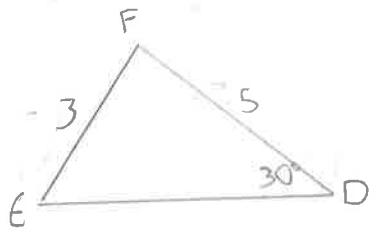
$$\angle C = 180 - 38.75$$
$$= 141.25^\circ$$

$$\angle B = 180 - 28 - 141.25$$
$$= 10.75^\circ$$

$$\frac{b}{\sin 10.75} = \frac{2.4}{\sin 28}$$

$$b = 0.95 \text{ cm}$$

(4) Case 1



$$\frac{5}{\sin E} = \frac{3}{\sin 30}$$

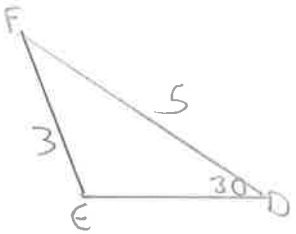
$$\angle E = 56.4^\circ$$

$$\angle F = 180 - 30 - 56.4$$
$$= 93.6^\circ$$

$$\frac{f}{\sin 93.6} = \frac{3}{\sin 30}$$

$$F = 6.0 \text{ cm}$$

Case 2



$$\angle E = 180 - 56.4$$
$$= 123.6^\circ$$

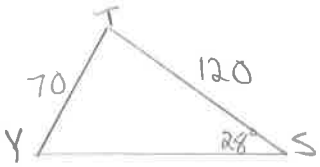
$$\angle F = 180 - 30 - 123.6$$
$$= 26.4^\circ$$

$$\frac{f}{\sin 26.4} = \frac{3}{\sin 30}$$

$$f = 2.7 \text{ cm}$$

(5)

Case 1



$$\frac{70}{\sin 28} = \frac{120}{\sin Y}$$

$\angle Y = 53.6°$

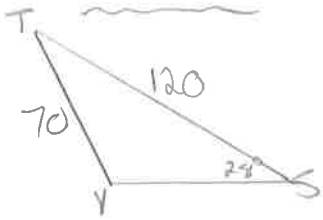
$\angle T = 180 - 28 - 53.6$

$= 98.4°$

$$\frac{t}{\sin 98.4} = \frac{70}{\sin 28}$$

$t = 147.5$ km

Case 2



$\angle Y = 180 - 53.6$

$= 126.4°$

$\angle T = 180 - 28 - 126.4$

$= 25.6$

$$\frac{t}{\sin 25.6} = \frac{70}{\sin 28}$$

$t = 64.4$ km

∴ Ship S could be 147.5 or 64.4 km from the yacht.