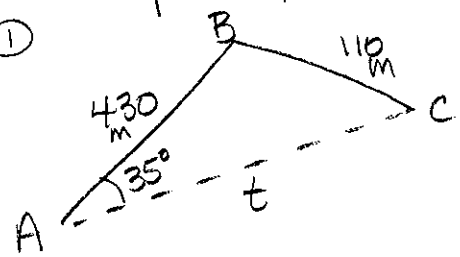
4.3 Foundations of Math 11

p. 183 # 6, 8, 10, 11

6. two possibilities

①



$$\frac{\sin C}{430} = \frac{\sin 35°}{110}$$

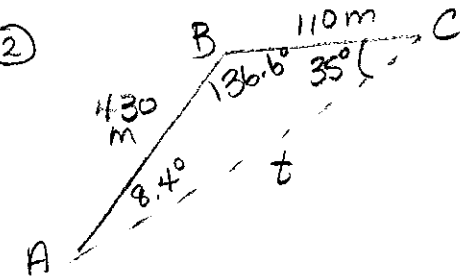
$$\sin C = \frac{430 \sin 35°}{110}$$

$$\sin C = \frac{430(0.573576)}{110}$$

$$\sin C = 2.242$$

* sin cannot be greater than 1!

②



step 1: $\frac{\sin A}{110} = \frac{\sin 35°}{430}$

$$\sin A = \frac{110 \sin 35°}{430}$$

$$\sin A = \frac{110(0.573576)}{430}$$

$$\sin A = 0.146739$$

$$\angle A = 8.4°$$

step 2:

$$\angle B = 180° - 35° - 8.4°$$

$$\angle B = 136.6°$$

step 3: $t^2 = 430^2 + 110^2 - 2(430)(110)\cos 136.6°$

$$t^2 = 184900 + 12100 + 68733.9639$$

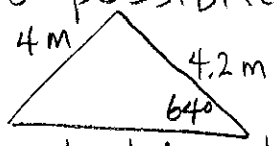
$$t^2 = 265733.9639$$

$$t = 515 \text{ m}$$ third side

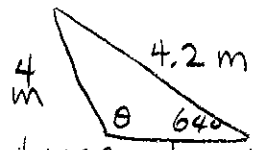
b) The description could be improved by stating that the 35° angle is at on end of the 110 m side.

p.183 cont.

8. two possibilities

① 

acute triangle

② 

obtuse triangle

a) $\frac{\sin\theta}{4.2} = \frac{\sin 64°}{4}$

$\sin\theta = \frac{4.2 \sin 64°}{4}$

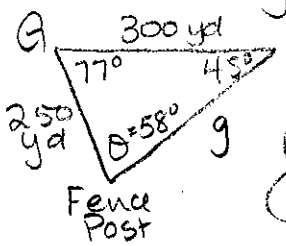
$\sin\theta = \frac{4.2(0.89879)}{4}$

$\sin\theta = 0.9437$

$\theta = 70.7°$

b) Yes, only one obtuse triangle is possible - the other is acute.

10. acute triangle



east than southwest means a 45° angle

① $\frac{\sin 45°}{250} = \frac{\sin\theta}{300}$

$\frac{300 \sin 45°}{250} = \sin\theta$

$\frac{300(0.7071)}{250} = \sin\theta$

$0.8485 = \sin\theta$

$\theta = 58°$

② $\angle G = 180° - 45° - 58°$

$\angle G = 77°$

③ $g^2 = 250^2 + 300^2 - 2(250)(300)\cos 77°$

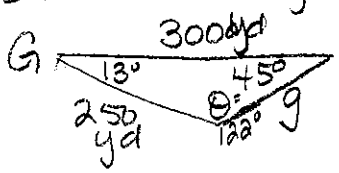
$g^2 = 62500 + 90000 - 33742.6582$

$g^2 = 118757.3418$

$g = 345$ m

p.183 cont.

10. cont. obtuse triangle

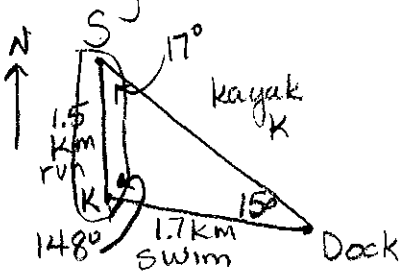


① $\theta = 180 - 58° = 122°$

② $\angle G = 180° - 122° - 45°$
$\angle G = 13°$

③ $g^2 = 250^2 + 300^2 - 2(250)(300)\cos 13°$
$g^2 = 62500 + 90000 - 146155.5097$
$g^2 = 6344.4903$
$g = 80$ m

11.



① $\dfrac{\sin S}{1.7} = \dfrac{\sin 15°}{1.5}$

$\sin S = \dfrac{1.7 \sin 15°}{1.5}$

$\sin S = \dfrac{1.7(0.2588)}{1.5}$

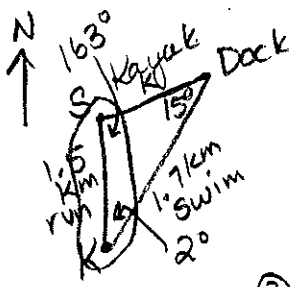
$\sin S = 0.2933$

$\angle S = 17°$

② $\angle K = 180° - 15° - 17°$
$\angle K = 148°$

③ $K^2 = 1.5^2 + 1.7^2 - 2(1.5)(1.7)\cos 148°$
$K^2 = 2.25 + 2.89 + 4.3250$
$K^2 = 9.465$
$K = 3.1$ km

OR



① $\angle S = 180° - 17° = 163°$

② $\angle K = 180° - 163° - 15° = 2°$

③ $K^2 = 1.5^2 + 1.7^2 - 2(1.5)(1.7)\cos 2°$
$K^2 = 2.25 + 2.89 - 5.09689$
$K^2 = 0.04311$
$K = 0.2$ km