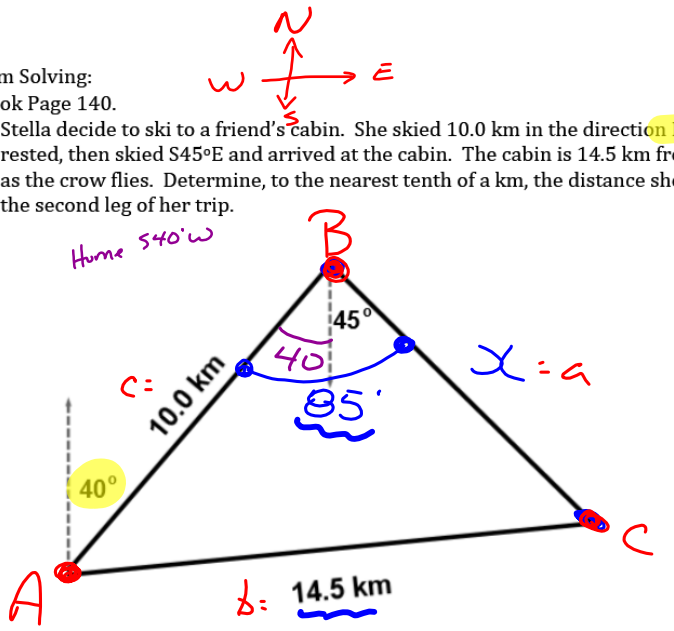
4.0 Problem Solving.TextBook

Problem Solving:
Textbook Page 140.

12. Stella decide to ski to a friend's cabin. She skied 10.0 km in the direction N40°E. She rested, then skied S45°E and arrived at the cabin. The cabin is 14.5 km from her home as the crow flies. Determine, to the nearest tenth of a km, the distance she travelled on the second leg of her trip.



II
A = 52
III
a =
B = 85 b = 14.5
C = 43 c = 10.0
I

I. $\frac{14.5}{\sin 85} = \frac{10.0}{\sin C}$

$\sin C = \frac{10(\sin 85)}{14.5}$

$C = \sin^{-1}(0.6870)$

$C = 43$

II. $A = 180 - 85 - 43$

$A = 52$

III $\frac{a}{\sin 52} = \frac{14.5}{\sin 85}$

$a = \frac{(14.5)(\sin 52)}{\sin 85} = 11.4698\ldots$

$a = 11.5$

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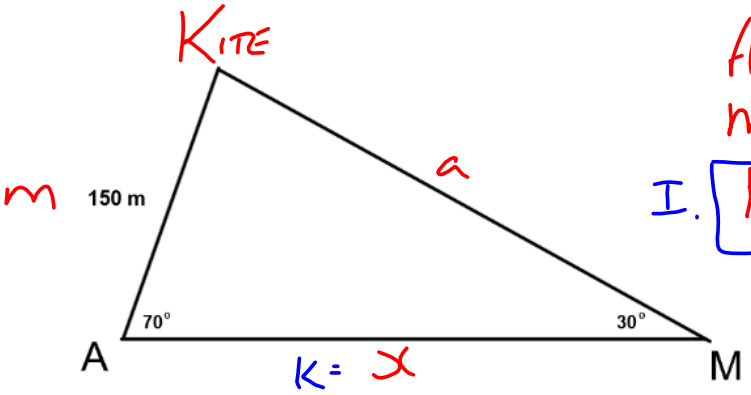
5. Allison is flying a kite. She has released the entire 150 m ball of kite string. She notices that the string forms a 70° angle with the ground. Marc is on the other side of the kite and see the kite at an angle of elevation of 30°. How far is Marc from Allison, to the nearest tenth of a metre?



A = 70 a =

M = 30 m = 150

I. K = 80 k =

II.

K = 180 - 70 - 30

$$\frac{k}{\sin 80} = \frac{150}{\sin 30}$$

$$k = \frac{(150)(\sin 80)}{\sin 30} = 295.442\ldots$$

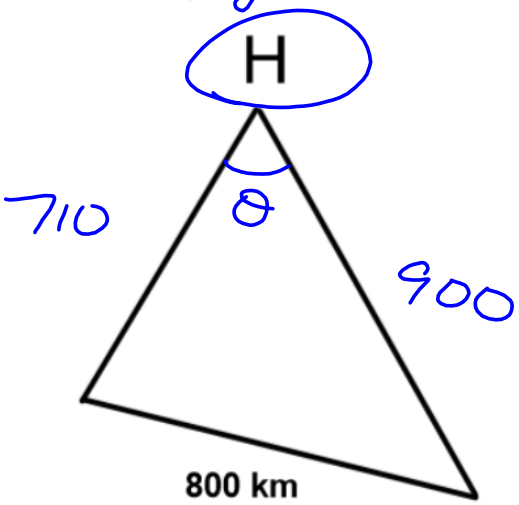
K = 295.4 m apart

9. Two airplanes leave the Hay River airport in the North West Territories at nearly the same time. One airplane travels at 355 km/h. The other airplane travels at 450 km/h. About 2h hours later, they are 800 km apart. Determine the angle between their paths, to the nearest degree.

Hay River

355 x 2 = 710

450 x 2 = 900



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

$\cos H = \frac{700^2 + 900^2 - 800^2}{2(700)(900)} = \frac{660000}{1260000}$

$H = \cos^{-1}(0.5238)$

$H = 58°$

4.0 Problem Solving.TextBook

Text Questions:
Page 139 - 3,4,6ab, 10 and 13
Page 151 - 4, 5, 7ab, 8, 13.

P139: 4

4. Scott is studying the effects of environmental changes on fish populations in his summer job. As part of his research, he needs to know the distance between two points on Lake Laberge, Yukon. Scott makes the measurements shown and uses the sine law to determine the lake's length as 36.0 km.

a) Agathe, Scott's research partner, says that his answer is incorrect. Explain how she knows.

b) Determine the distance between the two points to the nearest tenth of a kilometre.

The lake needs to be the longest side in the triangle; opposite the biggest angle of 74.

I A=54 a=41.0

B=52

C=74 b=

C=

A=180-74-52

A=54

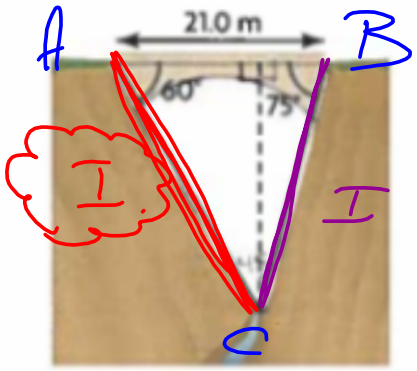
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{41}{\sin 54} = \frac{x}{\sin 74}$$

$$x = 48.7$$

P139: 13

13. A bridge has been built across a gorge. Jordan wants to bungee jump from the bridge. One of the things she must know, to make the jump safely, is the depth of the gorge. She measured the gorge as shown. Determine the depth of the gorge to the nearest tenth of a metre.



A = 60

B = 75

C = 45

* C = 45

b =

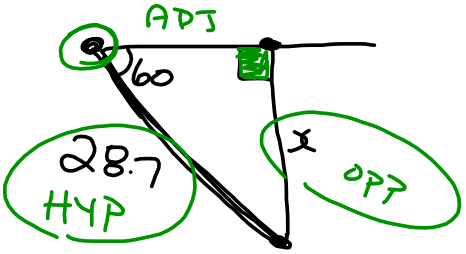
c = 21.0

180 - 60 - 75 = 45

$$\frac{b}{\sin 75} = \frac{21.0}{\sin 45}$$

$$b = \frac{(21.0)(\sin 75)}{\sin 45}$$

b = 28.7



SOH CAH TOA

$$\frac{\sin 60}{1} = \frac{x}{28.7}$$

x = 24.9