

Date: \_\_\_\_\_

## Today's Learning Goal(s):

By the end of the class, I will be able:

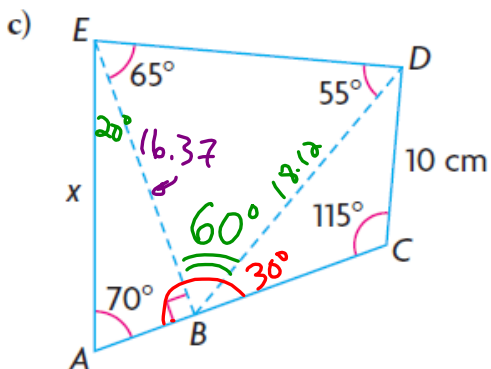
- a) prepared for the Unit 5 Summative Tuesday.

Last day's work: pp. 332-335 #3 – 6 [7, 14]

3d  
5 6  
14

p. 332 #3

3. Determine the value of  $x$  to the nearest centimetre and  $\theta$  to the nearest degree. Explain your reasoning for each step of your solution.



Side DB aka "c"

$$\frac{DB}{\sin 115^\circ} = \frac{10}{\sin 30^\circ}$$

$$DB = \sin 115^\circ \times \frac{10}{\sin 30^\circ}$$

Next Find EB  $\leftarrow \approx 18.12$ 

$$\frac{EB}{\sin 55^\circ} = \frac{18.12}{\sin 65^\circ}$$

$$EB = \sin 55^\circ \times \frac{18.12}{\sin 65^\circ}$$

$$\approx 16.37$$

use SOH in the right  $\triangle ABE$ 

$$\sin 70^\circ = \frac{16.37}{x}$$

$$x = \frac{16.37}{\sin 70^\circ}$$

$$\approx 17.42$$

$$\approx 17 \text{ cm}$$

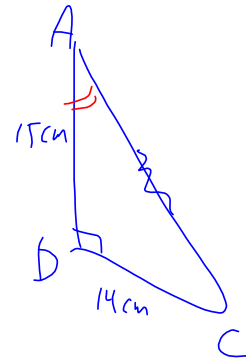
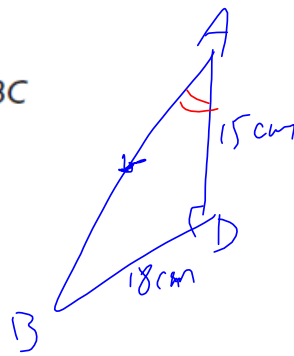
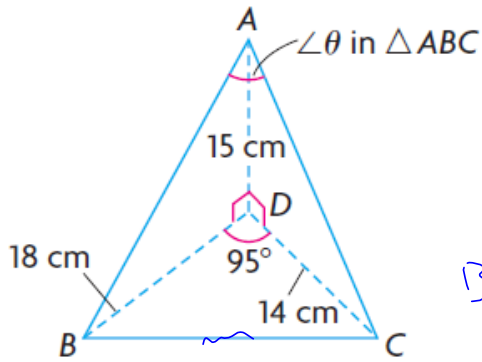
p. 332 #3

3. Determine the value of  $x$  to the nearest centimetre and  $\theta$  to the nearest degree. Explain your reasoning for each step of your solution.

**K**

*Please remind me to explain why my answer differs from the textbook and solution manual, which are incorrect.*

d)



$$AB^2 = 15^2 + 18^2$$

$$= 549$$

$$AB = \sqrt{549}$$

$$= 23.43$$

$$\approx 23.4 \text{ cm}$$

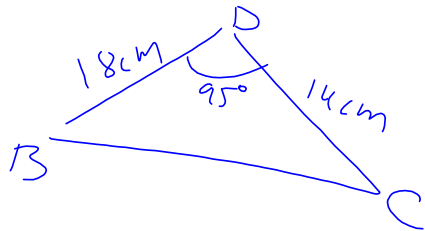
$$AC^2 = 15^2 + 14^2$$

$$= 421$$

$$AC = \sqrt{421}$$

$$= 20.51$$

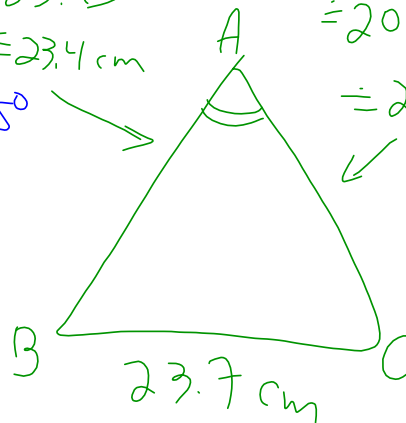
$$\approx 20.5 \text{ cm}$$



$$BC^2 = 14^2 + 18^2 - 2(14)(18)\cos 95^\circ$$

$$BC = \sqrt{563.92}$$

$$\approx 23.7$$



$$\cos A = \frac{23.4^2 + 20.5^2 - 23.7^2}{2(23.4)(20.5)}$$

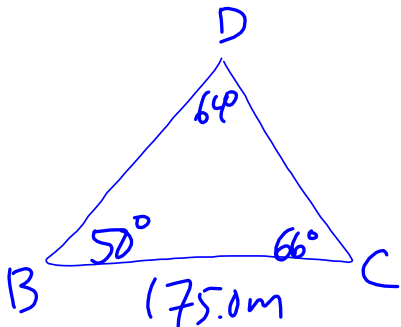
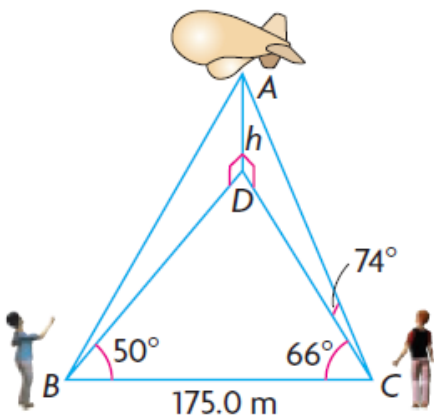
$$A = \cos^{-1}\left(\frac{4106.12}{959.4}\right)$$

$$\approx 64.9$$

$$\approx 65^\circ$$

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4. As a project, a group of students was asked to determine the altitude,  $h$ , of a promotional blimp. The students' measurements are shown in the sketch at the left.
- a) Determine  $h$  to the nearest tenth of a metre. Explain each of your steps.
- b) Is there another way to solve this problem? Explain.



$$\frac{DC}{\sin 50^\circ} = \frac{175.0}{\sin 64^\circ}$$

$$DC = \sin 50^\circ \times \frac{175.0}{\sin 64^\circ}$$

$$\approx 149.15$$

$$\tan 74^\circ = \frac{h}{DC}$$

$$h = 149.15 \tan 74^\circ$$

$$\approx 520.15$$

$$\approx 520.2 \text{ m}$$



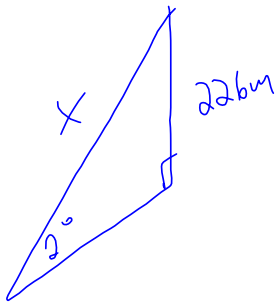
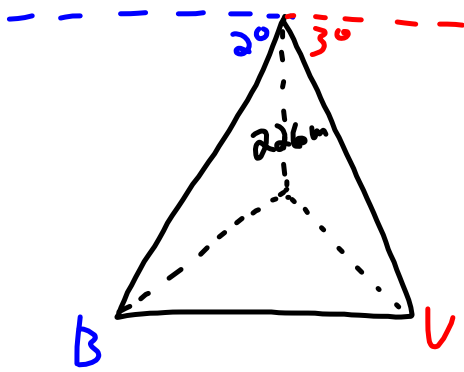
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5) While Travis and Bob were flying a hot-air balloon from Beamsville to Vineland in southwestern Ontario, they decided to calculate the straight-line distance, to the nearest metre, between the two towns.

- From an altitude of 226 m, they simultaneously measured the angle of depression to Beamsville as  $2^\circ$  and to Vineland as  $3^\circ$ .
- They measured the angle between the lines of sight to the two towns as  $80^\circ$ .

Is there enough information to calculate the distance between the two towns? Justify your reasoning with calculations.

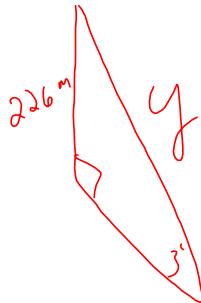
*Please remind me to explain why my answer differs from the textbook and solution manual, which are incorrect.*



$$\sin 2^\circ = \frac{226}{x}$$

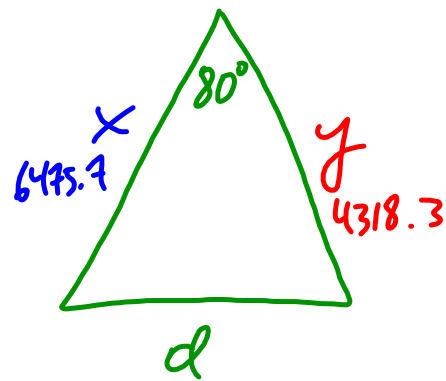
$$x = \frac{226}{\sin 2^\circ}$$

$$= 6475.7$$



$$y = \frac{226}{\sin 3^\circ}$$

$$= 4318.3$$



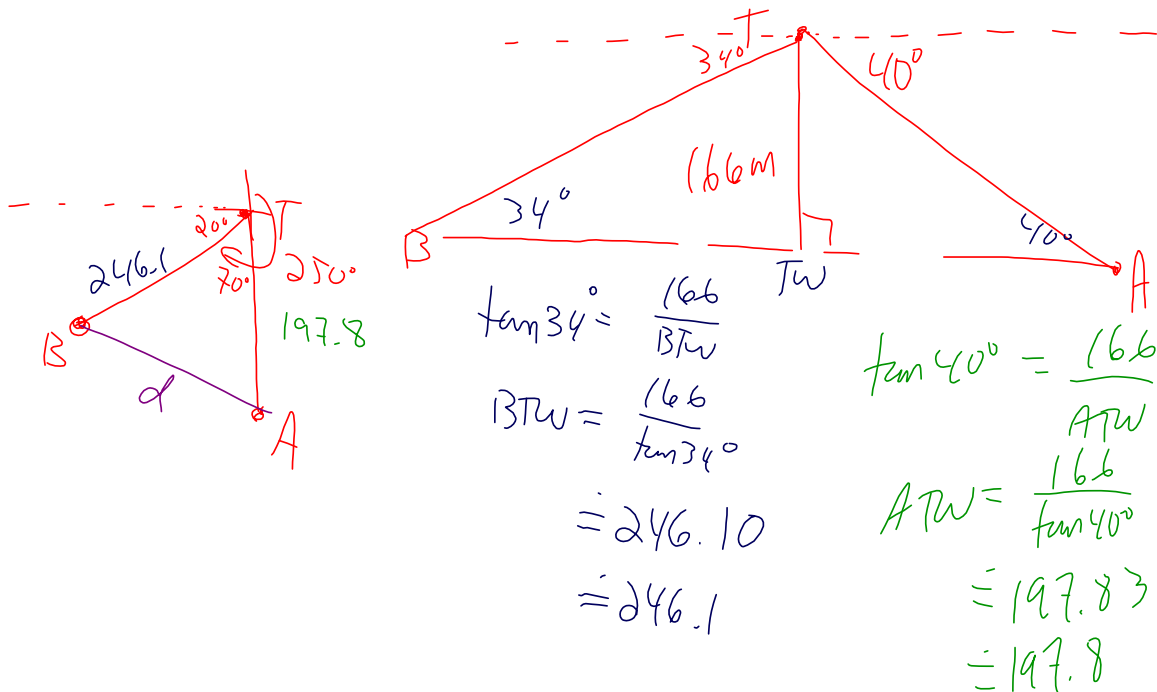
$$d^2 = 6475.7^2 + 4318.3^2 - 2(6475.7)(4318.3)\cos 80^\circ$$

$$d = 7132.36$$

$$= 7133 \text{ m}$$

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6. The observation deck of the Skylon Tower in Niagara Falls, Ontario, is  
**A** 166 m above the Niagara River. A tourist in the observation deck notices two boats on the water. From the tourist's position,
- the bearing of boat  $A$  is  $180^\circ$  at an angle of depression of  $40^\circ$
  - the bearing of boat  $B$  is  $250^\circ$  at an angle of depression of  $34^\circ$
- Calculate the distance between the two boats to the nearest metre.



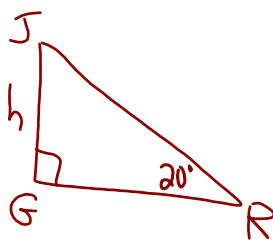
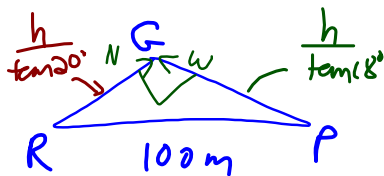
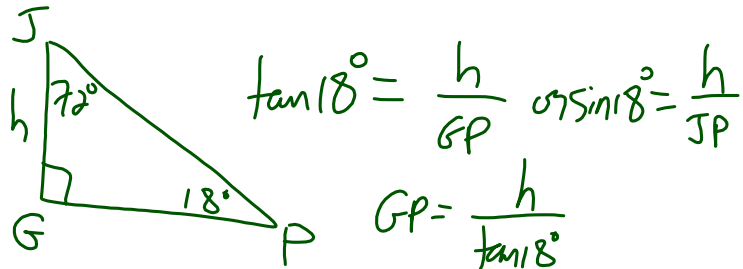
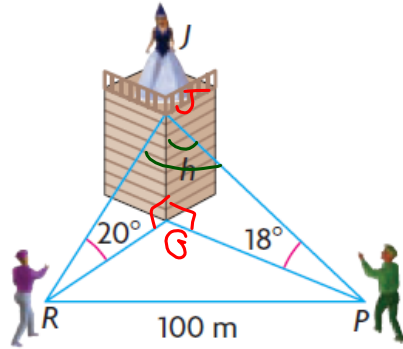
$$d^2 = 246.1^2 + 197.8^2 - 2(246.1)(197.8)\cos 70^\circ$$

$$d \approx 257.6$$

$$\approx 258 \text{ m}$$

- p. 333 7. Suppose Romeo is serenading Juliet while she is on her balcony. Romeo is facing north and sees the balcony at an angle of elevation of  $20^\circ$ . Paris, Juliet's other suitor, is observing the situation and is facing west. Paris sees the balcony at an angle of elevation of  $18^\circ$ . Romeo and Paris are 100 m apart as shown. Determine the height of Juliet's balcony above the ground, to the nearest metre.

*Please remind me to explain why my answer differs; don't worry too much about this one.*



from PT:  $GR^2 + GP^2 = 100^2$

$$\therefore \left(\frac{h}{\tan 20^\circ}\right)^2 + \left(\frac{h}{\tan 18^\circ}\right)^2 = 100^2$$

$$\frac{h^2}{(\tan 20^\circ)^2} + \frac{h^2}{(\tan 18^\circ)^2} = 100^2$$

\*Factor:  $h^2 \left( \frac{1}{(\tan 20^\circ)^2} + \frac{1}{(\tan 18^\circ)^2} \right) = 100^2$

$$h^2 = \frac{100^2}{\left(\frac{1}{(\tan 20^\circ)^2} + \frac{1}{(\tan 18^\circ)^2}\right)}$$

$$h = \sqrt{\frac{10\,000}{\left(\frac{1}{(\tan 20^\circ)^2} + \frac{1}{(\tan 18^\circ)^2}\right)}}$$

$$\approx 24.23$$

$$\approx 24 \text{ m above the ground}$$

**5.R Unit 5 Review Redo SWYK 5.1**

Date: \_\_\_\_\_

- 5.1 Trig Raos of Acute Angles ( **6** Trig Raos)
- 5.2 Trig Raos of Special Angles ( **Exact** Values)
- 5.3 Trig Raos of Obtuse Angles (Angles in Standard Posion)
- 5.4 **CAST** Rule & Related Acute Angles (RAA;  **$\beta$**  vs  **$\theta$** )
- 5.4 Evaluang Trigonometric Raos for  $0^\circ \leq \theta \leq 360^\circ$  (**Both** answers)
- 5.6 The Sine Law (& **Ambiguous** Case)
- 5.7 The Cosine Law
- 5.8 Solving 3-Dimensional Problems Using Trigonometry



8. Use each trigonometric ratio to determine all values of  $\theta$ , to the nearest degree if  $0^\circ \leq \theta \leq 360^\circ$ .

a)  $\sin \theta = 0.4815$

b)  $\tan \theta = -0.1623$

$$\tan \beta = 0.1623$$

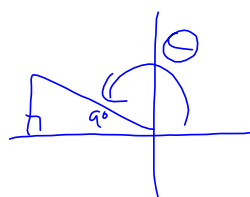
$$\beta = \tan^{-1}(0.1623)$$

$$\approx 9.2$$

$$\approx 9^\circ$$

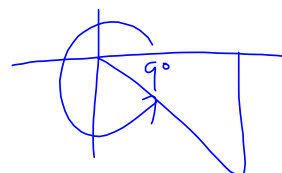
S	A
T	C

QII



$$\therefore \theta \approx 171^\circ$$

or QIV



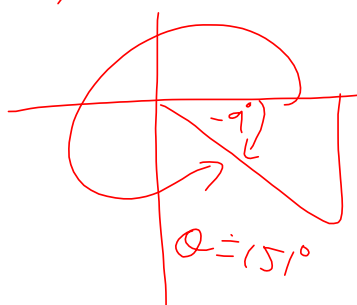
$$\text{or } \theta \approx 351^\circ$$

$$\theta = \tan^{-1}(-0.1623)$$

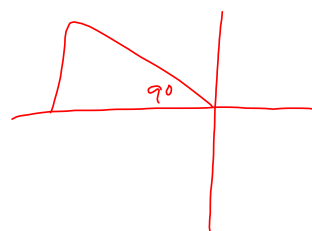
$$\approx -9.2$$

$$\approx -9^\circ$$

$$\therefore \beta = 9^\circ$$



$$\theta \approx 151^\circ$$



$$\text{or } \theta \approx 171^\circ$$

**Are there any Homework Questions you would like to see on the board?**

Last day's work: pp. 332-335 #3 – 6 [7, 14]

Today's Homework Practice includes:

pp. 338-339 #1 – 5, 8 – 13

p. 340 #2