Warm Up

Given $\triangle RST$ has angle R = 58° , r = 48 and s = 25.
Solve the triangle, if there is more than one possible, solve both!!

$*$ SSA
$\checkmark$ acute
$\cancel{X}$ $a < b$ $\rightarrow$ 1 solution

$b=25$ ② 96° $a=48$
58° 26 ①
A R ③

$\cancel{\text{$\angle$B}}$

① $\dfrac{25 \sin S}{25} = \dfrac{25 \sin 58}{48}$

$\sin^{-1} \sin S = \boxed{(0.4417)}$

$\sin^{-1}$ $\boxed{\angle S = 26}$

$\dfrac{t \sin 96}{\sin 96} = \dfrac{48 \sin 96}{\sin 58}$

$\boxed{t = 56.3}$

② $\angle T = 180$
$\quad\quad\;\; 58$
$\quad\quad\;\; 26$
$\boxed{\angle T = 96}$

HOMEWORK... *Questions*

Worksheet - Ambiguous Case.pdf

#5, 6, & 7
Page 184: #7, 8, 11

7. The *Raven's Song*, a traditional Tsimshian cedar canoe, is paddled away from a dock, directly toward a navigational buoy that is 5 km away. After reaching the buoy, the direction of the canoe is altered and it is paddled another 3 km. From the dock, the angle between the buoy and the canoe's current position measures 12°.
   a) How far is the *Raven's Song* from the dock?
   b) Is this the only possible solution? Explain.

2 solutions

Bill Helin carved the *Raven's Song* from a 600-year-old cedar taken from the Nimpkish Valley. The canoe was created to carry a message of goodwill from the First Nations Peoples of the West Coast of British Columbia to the 1994 Commonwealth Games in Victoria.

Handwritten work

① $\dfrac{\sin P}{5} = \dfrac{\sin 12}{3}$

$\sin P = (0.3465)$

$\sin^{-1}$

$\angle P = 20°$

$\angle B = 148°$

$\dfrac{x}{\sin 148} = \dfrac{3 \sin 148}{\sin 12}$

$\boxed{x = 7.6 \text{ km}}$

$\dfrac{x}{\sin 8°} = \dfrac{3 \sin 8°}{\sin 12}$

OR

$\angle P = 160°$

$\angle B = 8°$

$\boxed{x = 2.0 \text{ m}}$

√ SSA
√ acute
√ a < b
alt = 5 sin 12°
alt = 1.04
a vs alt
3 > 1.04
* ambiguous

REVIEW - Trigonometry

- Pythagorean Theorem & Primary Trig Ratios

REMEMBER: "SOH CAH TOA"

$$\sin \theta = \frac{opp}{hyp} \qquad \cos \theta = \frac{adj}{hyp} \qquad \tan \theta = \frac{opp}{adj}$$

$$c^2 = a^2 + b^2$$

HYP   OPP
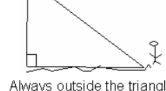
θ

Reference angle   ADJ
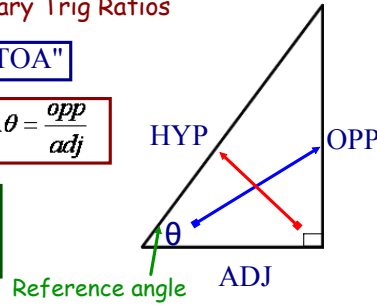
- Applications of Primary Trig

Angle of elevation – is the angle between the ground and the line of sight. (angle of inclination)

Always from the GROUND up

Angle of Depression – is the angle between the horizon and the line of sight.

Always outside the triangle

Also, note that the angle of elevation = angle of depression

- Law of Sines & Its Applications

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

"when looking for a <u>side</u>"   "when looking for an <u>angle</u>"

- Ambiguous Case??? (Law of Sines - finding an angle)
  - given a side (a), the angle opposite (A) and another side (b)...

  CASE #1: a > b -> only one solution
  CASE #2: a = b -> only one solution
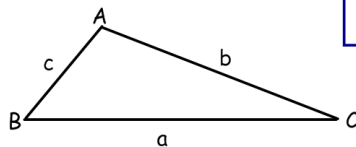 CASE #3: a < b ... Determine the altitude length (bsinA)
  (i) a < altitude -> no solution
  (ii) a = altitude -> one solution (right triangle)
  (iii) a > altitude -> two solutions...   (Ambiguous Case)
  (1) acute angle
  (2) obtuse angle (180° - acute)

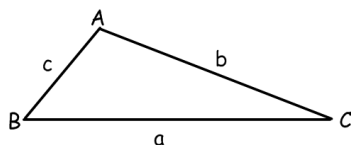- Law of Cosines & Its Applications

  Finding an unknown side...
  • 2 sides and a contained angle (SAS)

  A

  c   b

  B   a   C

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

  Finding an unknown angle...
  • 3 known sides (SSS)

  A

  c   b

  B   a   C

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

- Bearings and Multi-step Word Problems

- "Solving" - find ALL angles & sides

Review for Test - Lots of Practice from the Textbook!!!

Chapter Review...   Page 128 ⎤ Chp. 3
(Frequently Asked Questions)   Page 153 ⎦
                                         Page 174 ⎤ Chp. 4
                                         Page 199 ⎦

Tues Test!!

Practice Questions...   *Bearing #11, 12*   Page 129 #1 - 9 ⎤ Chp 3
Ambiguous Case → 4.3   Page 154 #1 - 12 ⎦
                                                 Page 175 #1 - 9 ⎤ Chp 4
                                                 Page 200 #1 - 8 ⎦

Practice Tests...   *Bearing #8*   Page 152 #1 - 8   Chp. 3
                                                 Page 198 #1 - 7   Chp. 4

Attachments

Worksheet - Ambiguous Case.pdf