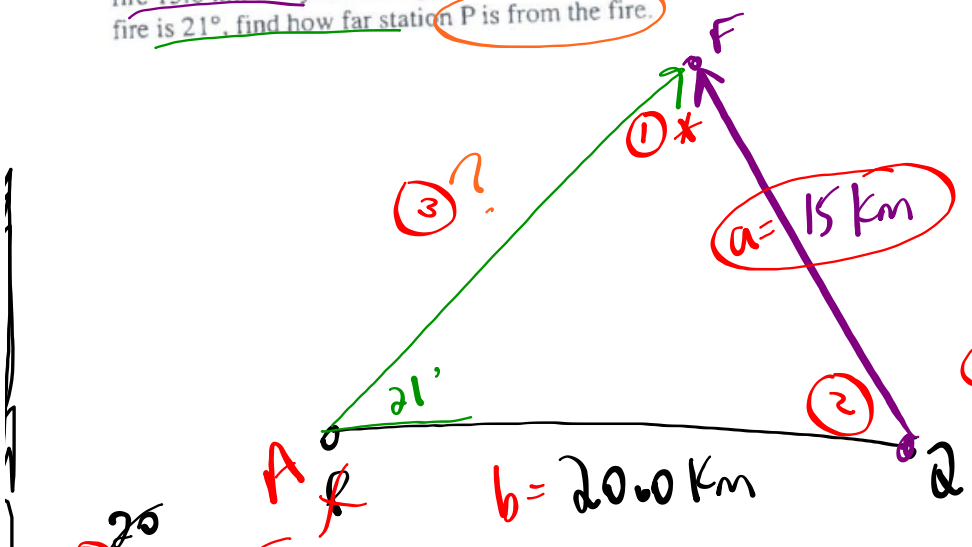
HOMEWORK ???

6 Two forest fire stations, P and Q, are 20.0 km apart. A ranger at station Q sees a fire 15.0 km away. If the angle between the line PQ and the line from P to the fire is 21°, find how far station P is from the fire.



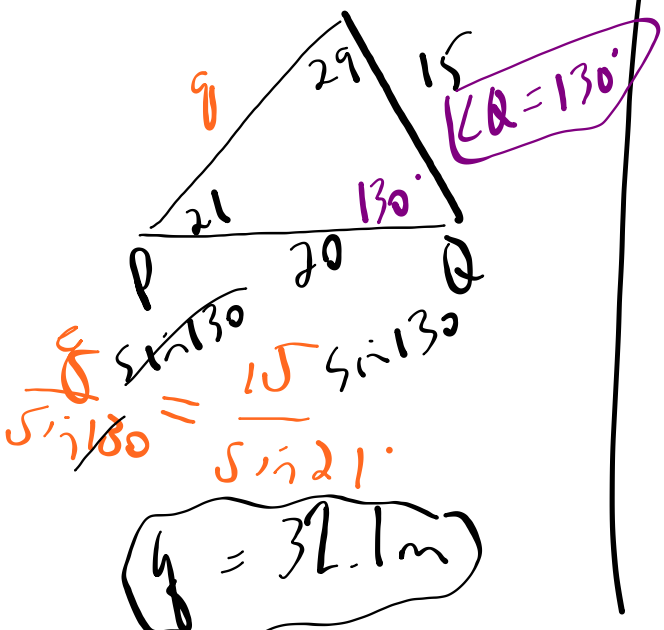
*ambiguous
- SSA ✓
- acute ✓
- a < b ✓

alt = 20 sin 21°
alt = 7.2
1) a < alt
2) a = alt
3) a > alt
*ambiguous 2 solutions

$\frac{\sin F}{20} = \frac{\sin 21°}{15}$

sin F = 20sin(21)/15 .4778239327
sin⁻¹(Ans 28.54337582

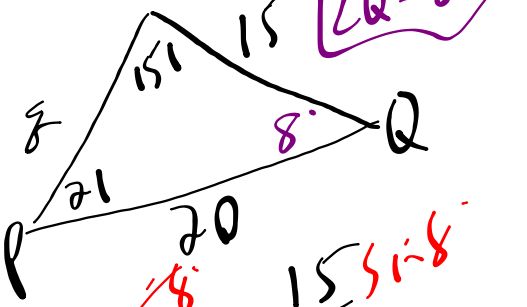
*∠F = 29° or ∠F = 180 − 29° ∠F = 151°



∠Q = 130°

$\frac{q}{\sin 130} = \frac{15}{\sin 21°}$

q = 32.1 m



∠Q = 8°

$\frac{q \sin 8°}{\sin 8°} = \frac{15 \sin 8°}{\sin 21°}$

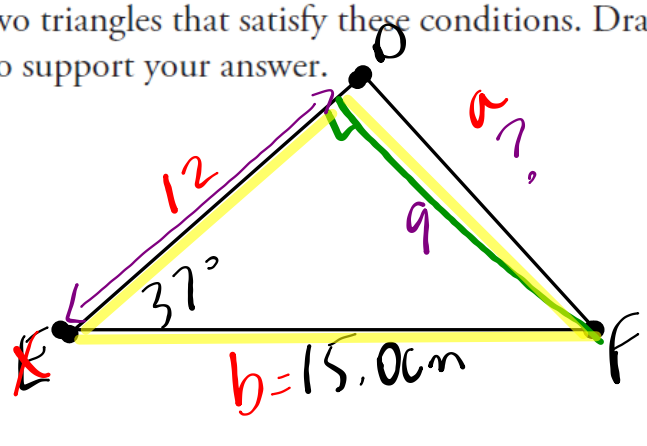
q = 5.8 m

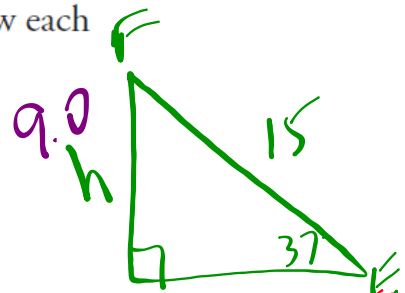
3-4-5 ×3
9-12-15

5. In $\triangle DEF$, $EF = 15.0$ cm and $\angle E = 37°$.

a) Calculate the height of the triangle from base ED. 9.0 cm

b) Determine the possible lengths of side FD, so that there are zero, one, or two triangles that satisfy these conditions. Draw each triangle to support your answer.





$\frac{h}{15} = \sin 37°$

$15 \sin 37° = h$

$9.0 = h$

	a	vs	alt	
1)	7	<	9	no solution
2)	9	=	9	1 solution
3)	12	>	9	* ambiguous 2 solutions

110sin(35)/430
.1467288558
sin⁻¹(Ans
8.437406244

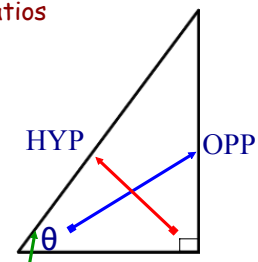
REVIEW - Trigonometry

- Pythagorean Theorem & Primary Trig Ratios

REMEMBER: "SOH CAH TOA"

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

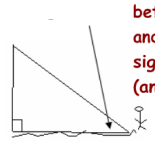
$c^2 = a^2 + b^2$



Reference angle

- 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

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

"when looking for a side" "when looking for an angle"

- Ambiguous Case??? (Law of Sines - finding an angle) *SSA
  - 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)

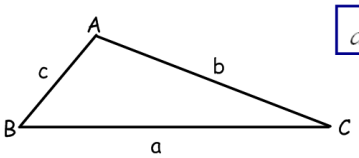
* Refer to the NOTES

(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)

alt = bsinA

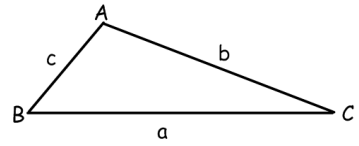
- Law of Cosines & Its Applications

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



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

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



opposite

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

- Bearings and Multi-step Word Problems
- "Solving" - find ALL angles & sides

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

Chapter Review...
(Frequently Asked Questions)

- Page 128
- Page 153
- Page 174
- Page 199

Chp. 3
Chp. 4

Tuesday Test!

Practice Questions...

* Ambiguous case → 4.3

Bearing #11, 12 →

- Page 129 #1 - 9
- Page 154 #1 - 12
- Page 175 #1 - 9
- Page 200 #1 - 8

Chp 3
Chp 4

Bearing #8 →

Practice Tests...

- Page 152 #1 - 8
- Page 198 #1 - 7

Chp. 3
Chp. 4