Warm Up

Ambiguous Case

Determine the measure of the obtuse angle B:

28

23

C

A 41° B

$$\frac{28 \sin B}{28} = \frac{28 \sin 41}{23}$$
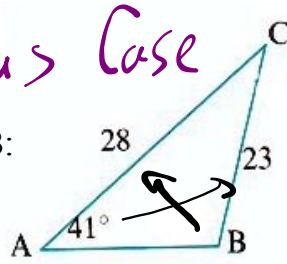
$$\sin^{-1} \sin B = \sin^{-1}(0.7987)$$

$$\angle B = 53° \, ?$$

Obtuse

$$180 - 53$$

$$= \boxed{127°}$$

·Foundations of Math 11 - March 23

Posted: March 23, 2016

HOMEWORK: p. 254 #5, #9 - 12 and p. 272 #9, 12, & 14

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

$$S = \frac{d}{t}$$

355 km/h for 2hrs
$d = 355 \times 2$

450 km/h
$d = 450 \times 2$

710 km θ 900 km

800 km
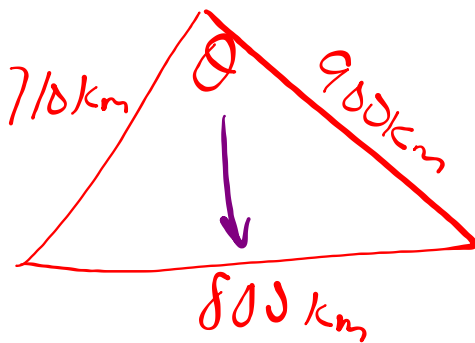
$$\cos\theta = \frac{710^2 + 900^2 - 800^2}{2(710)(900)}$$

$$\cos^{-1}\cos\theta = \cos^{-1}\left(\frac{674100}{1278000}\right)$$

$$\theta = 58°$$

11. A bush pilot delivers supplies to a remote camp by
    flying 255 km in the direction N52°E. While at
    the camp, the pilot receives a radio message to pick
    up a passenger at a village. The village is 85 km
    S21°E from the camp. What is the total distance,
    to the nearest kilometre, that the pilot will have
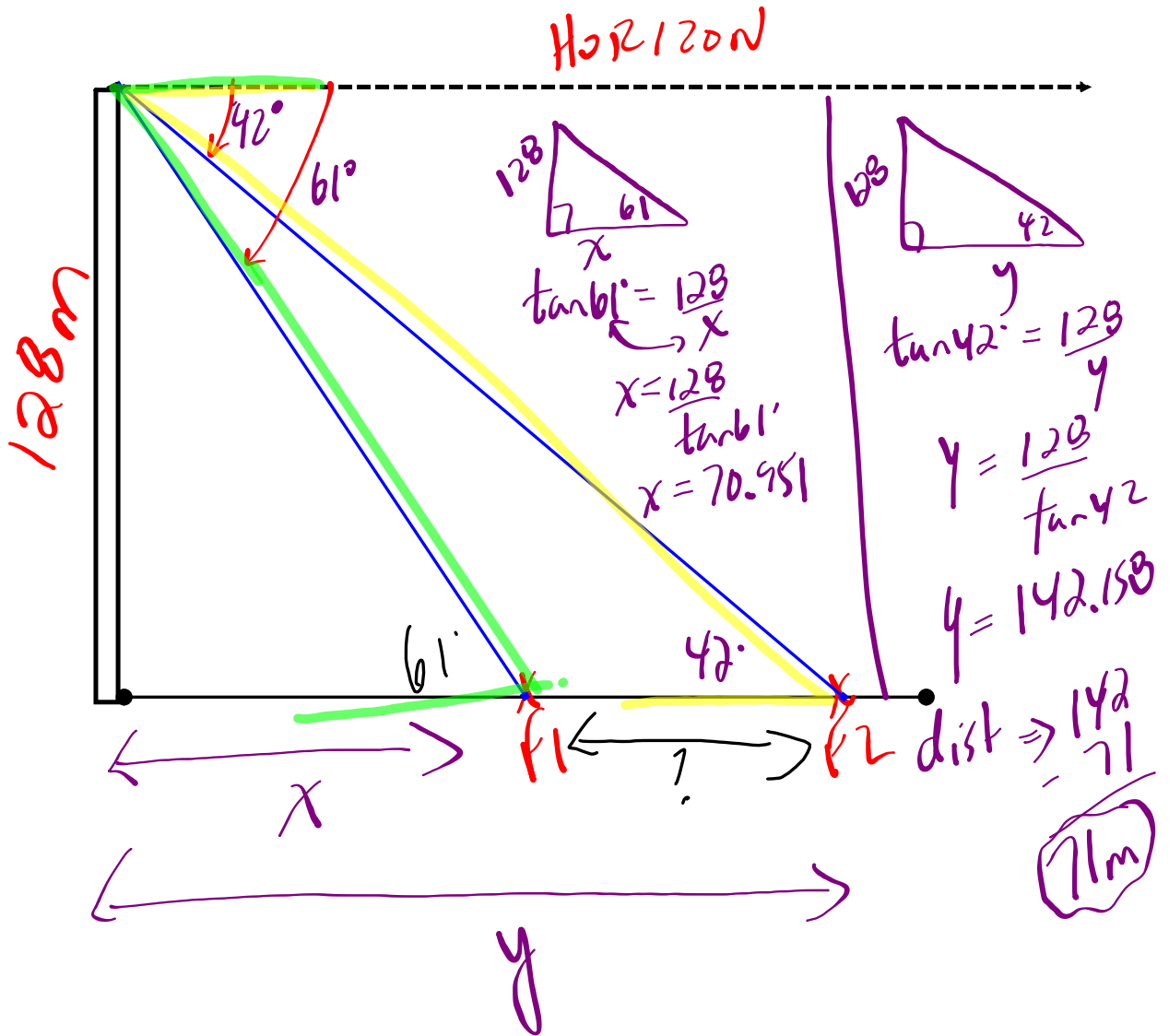   flown by the time he returns to his starting point?
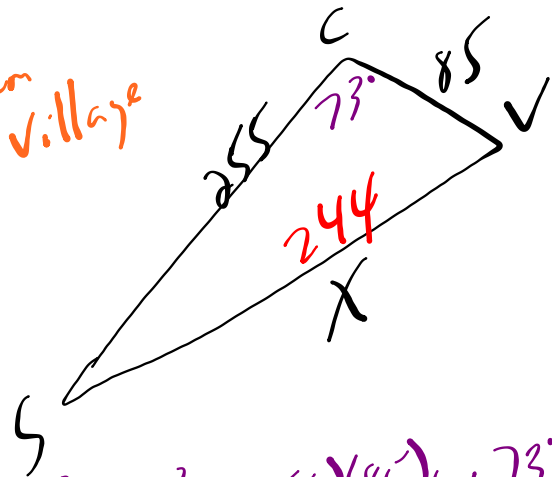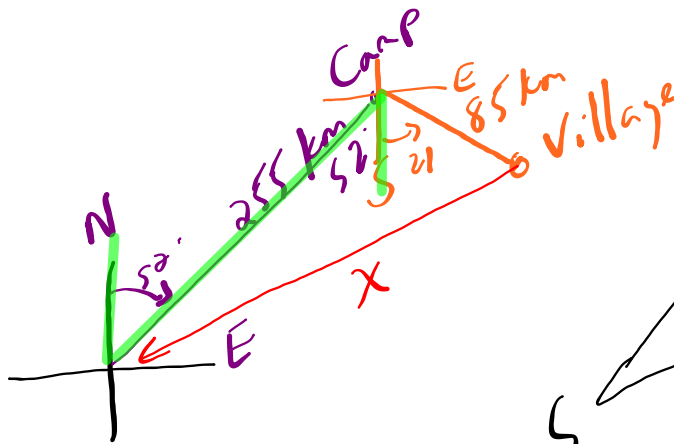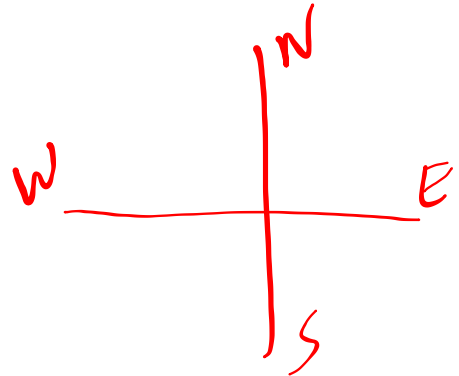
$$x^2 = 255^2 + 85^2 - 2(255)(85)\cos 73°$$

$$x^2 =$$

$$x^2 =$$

```
255²+85²-2*255*8
5*cos(73)
        59575.6866
√(Ans
        244.0813115
```
$$x =$$

TOTAL => 244 + 255 + 85

= 584 km

HORIZON

42°

61°

128m

61°

42°

$\tan 61° = \dfrac{128}{x}$

$x = \dfrac{128}{\tan 61}$

$x = 70.951$

$\tan 42° = \dfrac{128}{y}$

$y = \dfrac{128}{\tan 42}$

$y = 142.158$

dist $\Rightarrow$ 142
71

(71m)

f1

f2

X

y

?

Trigonometry Summary AND 'The AMBIGUOUS Case'...

Need to Know

- The sine law and cosine law are used with obtuse triangles in the same way that they are used with acute triangles.
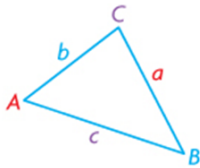
sine law
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

oblique triangle

A triangle that does not contain a 90° angle.

Use the sine law when you know ... *ELSE*	Use the cosine law when you know ... *FIRST*
- the lengths of two sides and the measure of the angle that is opposite a known side	- the lengths of two sides and the measure of the contained angle *SAS*
- the measures of two angles and the length of any side or	- the lengths of all three sides *SSS*

Ambiguous Case

- Be careful when using the sine law to determine the measure of an angle. The inverse sine of a ratio always gives an acute angle, but the supplementary angle has the same ratio. You must decide whether the acute angle, θ, or the obtuse angle, $180° - \theta$, is the correct angle for your triangle.