

Date: _____

8.5 Solving Acute Triangle Problems

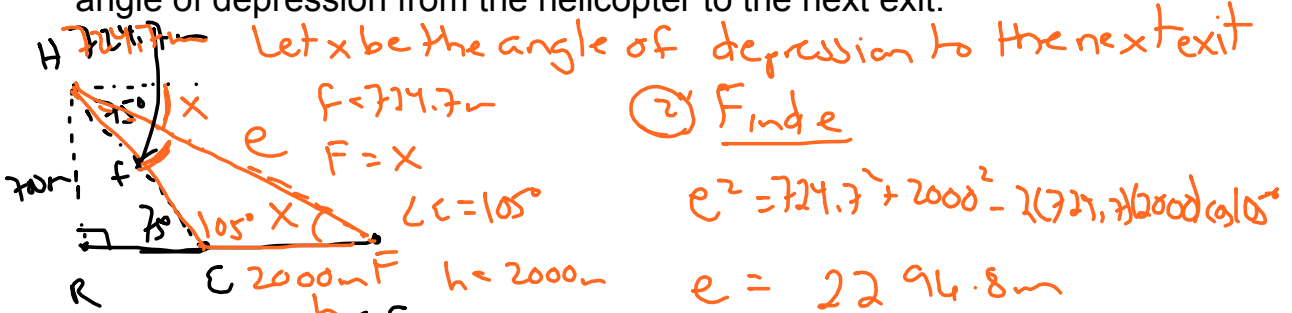


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Given Information	Trying to Find	Use
A right triangle 	side/angle	SOH CAH TOA
Two sides and an opposite angle. 	angle	Sine Law
Two sides and a contained angle. 	side	Cosine Law
Two angles and any side. 	side	Sine Law
Three sides. 	angle	Cosine Law

Practice Problems

1. A helicopter is 700 m directly above a highway. The angle of depression to exit 85 is 75° . The next exit is located 2 km from exit 85. Determine the angle of depression from the helicopter to the next exit.



① Find length of f

So $\sin 75^\circ = \frac{700}{f}$
 $f = \frac{700}{\sin 75^\circ}$
 $= 724.7 \text{ m}$

③ Find $\angle F$ (or x)

$\frac{\sin x}{724.7} = \frac{\sin 105^\circ}{2296.8}$ \therefore The angle is 17.7°
 $\sin x = \frac{724.7 \sin 105^\circ}{2296.8}$
 $x = 17.7^\circ$

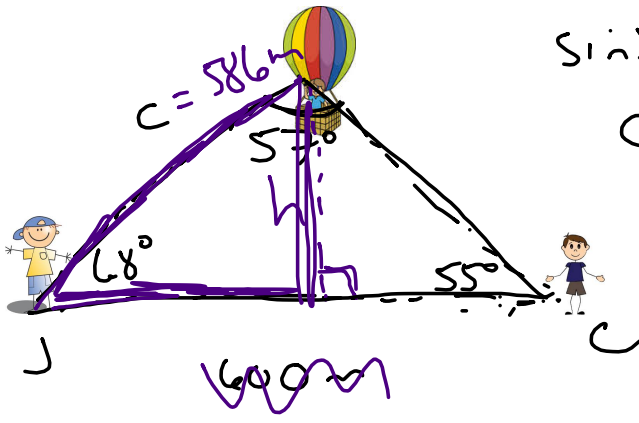
2. Jax and Colby are standing 600 m apart in a field. Emad is in a hot air balloon somewhere in between Jax and Colby. The angle of elevation to the balloon from Colby is 55° and the angle of elevation from Jax to the balloon is 68° . Determine the height of the balloon.

Let h be the height of the balloon.

① Angle ϵ
 $\angle \epsilon = 180 - 68 - 55$
 $= 57$

② Find c (or j)

③ Find h



$\frac{c}{\sin 55^\circ} = \frac{600}{\sin 57^\circ}$
 $c = \frac{600 \sin 55^\circ}{\sin 57^\circ}$
 $= 586 \text{ m}$

$\sin 68^\circ = \frac{h}{586}$
 $h = 586 \sin 68^\circ$
 $= 543.3 \text{ m}$

\therefore The balloon is 543.3m high.