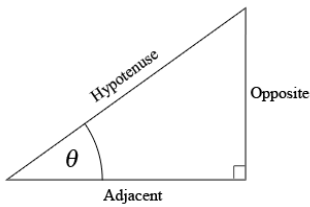


7.5 Solving Problems Involving Right Triangles



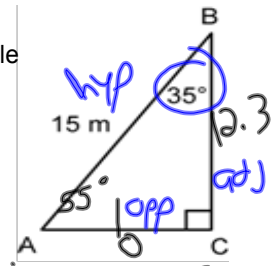
$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

DO IT NOW!!!

1 Solve the triangle



$$\angle A = 180 - 90 - 35 = 55$$

side a

$$\cos 35 = \frac{a}{15}$$

$$15(\cos 35) = a$$

$$a = 12.3$$

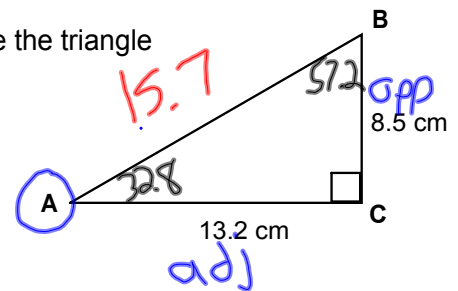
side b

$$\sin 35 = \frac{b}{15}$$

$$15(\sin 35) = b$$

$$b = 8.6$$

2 Solve the triangle



$$\tan A = \frac{8.5}{13.2}$$

$$\angle A = \tan^{-1}\left(\frac{8.5}{13.2}\right)$$

$$\angle A = 32.8^\circ$$

LB

$$\angle B = 180 - 90 - 32.8$$

$$= 57.2^\circ$$

Side c


$$\sin 32.8 = \frac{8.5}{c}$$

$$c = \frac{8.5}{\sin 32.8}$$

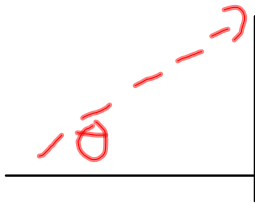
$$c = 15.7 \text{ cm}$$

Before doing application questions, we need to know:

1) Angle of depression (aka declination)
- angle measured below the horizontal

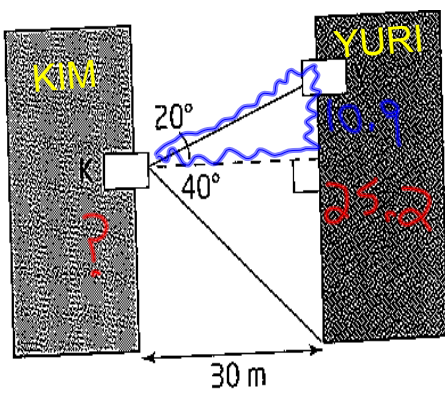


2) Angle of elevation (aka inclination)
- angle measured above the horizontal




Kim and Yuri live in apartment buildings that are 30 m apart. The angle of depression from Kim's balcony to where Yuri's building meets the ground is 40° . The angle of elevation from Kim's balcony to Yuri's balcony is 20° .

a) How high is Kim's balcony from the ground?
b) How high is Yuri's balcony from the ground?



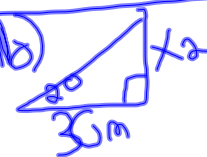
a) 40°



$$\tan 40 = \frac{x_1}{30}$$

$$x_1 = 25.2 \text{ m}$$

b)



$$\tan 20 = \frac{x_2}{30}$$

$$x_2 = 10.9 \text{ m}$$

The height of Yuri's balcony is 36.1m