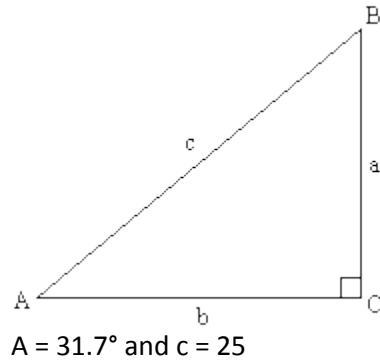
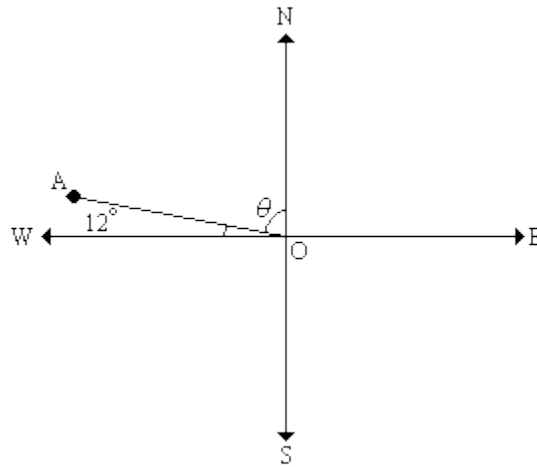


Review Exercise Set 8

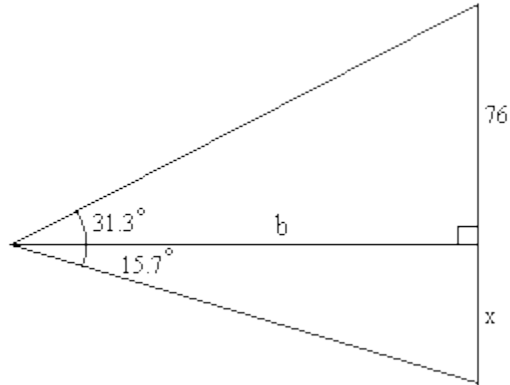
Exercise 1: Solve the given right triangle rounding lengths to two decimal places and angles to the nearest tenth of a degree.



Exercise 2: Use the given figure to find the bearing from O to A.



Exercise 3: Find the length of x in the given diagram.

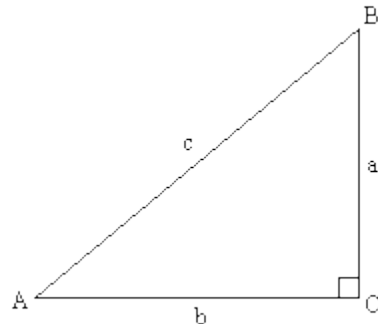


Exercise 4: Two buildings with level roofs are 150 feet apart. The height of the shorter building is 120 feet. From the roof of the shorter building, the angle of elevation to the edge of the roof of the taller building is 35° . Find the height of the taller building to the nearest foot.

Exercise 5: From city A to city B, a plane flies 800 miles at a bearing of $N 53^\circ E$. The plane then leaves city B for city C. From city B to city C, the plane flies 1000 miles at a bearing of $S 37^\circ E$. Find the distance between city A and city C (to the nearest tenth of a mile) and the bearing from city A to city C.

Review Exercise Set 8 Answer Key

Exercise 1: Solve the given right triangle rounding lengths to two decimal places and angles to the nearest tenth of a degree.



$$A = 31.7^\circ \text{ and } c = 25$$

Find side a

$$\sin A = \frac{a}{c}$$

$$\sin 31.7^\circ = \frac{a}{25}$$

$$25 \sin 31.7^\circ = a$$

$$13.14 \approx a$$

Find side b

$$\cos A = \frac{b}{c}$$

$$\cos 31.7^\circ = \frac{b}{25}$$

$$25 \cos 31.7^\circ = b$$

$$21.27 \approx b$$

Find angle B

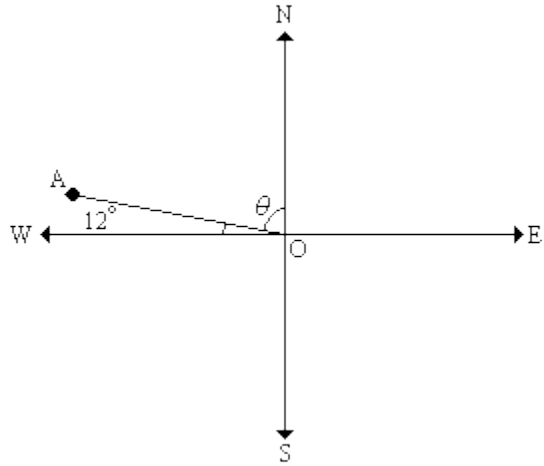
$$A + B + C = 180^\circ$$

$$31.7^\circ + B + 90^\circ = 180^\circ$$

$$B + 121.7^\circ = 180^\circ$$

$$B = 58.3^\circ$$

Exercise 2: Use the given figure to find the bearing from O to A.



Find the complementary angle for 12°

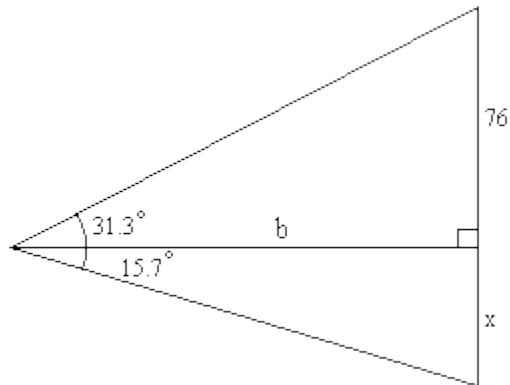
$$12^\circ + \theta = 90^\circ$$

$$\theta = 78^\circ$$

Use the angle to write the bearing from O to A

The bearing from O to A is N 78° W

Exercise 3: Find the length of x in the given diagram.



Find the length of side b

$$\tan 31.3^\circ = \frac{76}{b}$$

$$b(\tan 31.3^\circ) = 76$$

$$b = \frac{76}{\tan 31.3^\circ}$$
$$\approx 125$$

Exercise 3 (Continued):

Find the length of side x

$$\tan 15.7^\circ = \frac{x}{b}$$

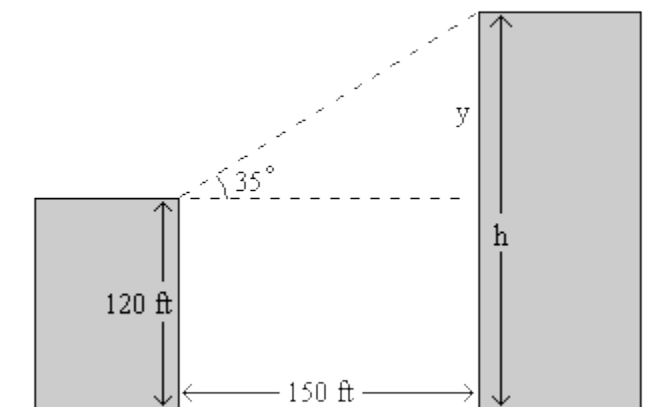
$$\tan 15.7^\circ \approx \frac{x}{125}$$

$$125(\tan 15.7^\circ) \approx x$$

$$35.14 \approx x$$

Exercise 4: Two buildings with level roofs are 150 feet apart. The height of the shorter building is 120 feet. From the roof of the shorter building, the angle of elevation to the edge of the roof of the taller building is 35° . Find the height of the taller building to the nearest foot.

Draw a diagram of the situation



y = difference in the heights of the two buildings
 h = height of the taller building

Find y

$$\tan \theta = \frac{y}{x}$$

$$\tan 35^\circ = \frac{y}{150}$$

$$150(\tan 35^\circ) = y$$

$$105 \approx y$$

Exercise 4 (Continued):

Find h

$$h = 120 + y$$

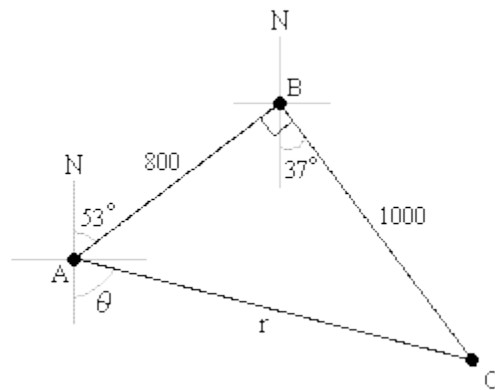
$$h \approx 120 + 105$$

$$h \approx 225$$

The height of the taller building is approximately 225 feet.

Exercise 5: From city A to city B, a plane flies 800 miles at a bearing of N 53° E. The plane then leaves city B for city C. From city B to city C, the plane flies 1000 miles at a bearing of S 37° E. Find the distance between city A and city C (to the nearest tenth of a mile) and the bearing from city A to city C.

Draw a diagram of the situation



Find angle A

$$\tan A = \frac{\text{length of side opposite}}{\text{length of side adjacent}}$$

$$\tan A = \frac{1000}{800}$$

$$A = \tan^{-1} 1.25$$

$$A \approx 51.34^\circ$$

Exercise 5 (Continued):

Find side r

$$\sin A = \frac{\text{length of side opposite}}{\text{length of hypotenuse}}$$

$$\sin 51.34^\circ \approx \frac{1000}{r}$$

$$r(\sin 51.34^\circ) \approx 1000$$

$$r \approx \frac{1000}{\sin 51.34^\circ}$$
$$\approx 1280.6$$

Find the angle θ

$$53^\circ + A + \theta = 180^\circ$$

$$53^\circ + 51.34^\circ + \theta \approx 180^\circ$$

$$104.34^\circ + \theta \approx 180^\circ$$

$$\theta \approx 75.66^\circ$$

The distance between city A and C is approximately 1,280.6 miles and the bearing from city A to city C is S 75.66° E.