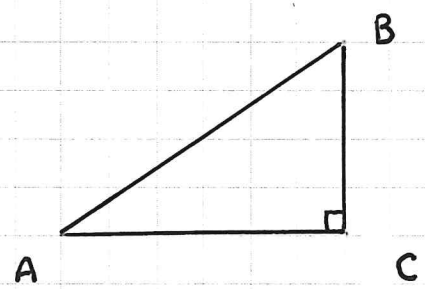
4.8 Right Triangle Applications

Ex. ① Solve the triangle



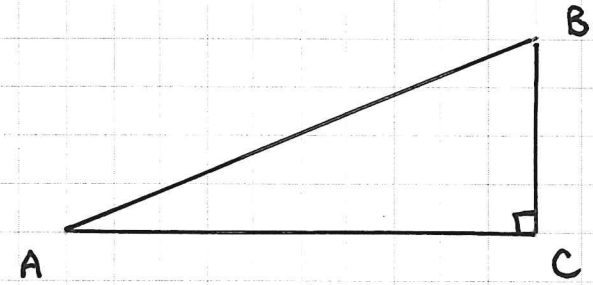
$A = 40.3°$ $\quad a = 3.45$ cm

$B =$ $\quad b =$

$C = 90°$ $\quad c =$

1) Find

Ex. ② Solve the triangle.



$A =$	$a = 5\text{ m}$
$B =$	$b =$
$C = 90°$	$c = 13\text{ m}$

1) Find

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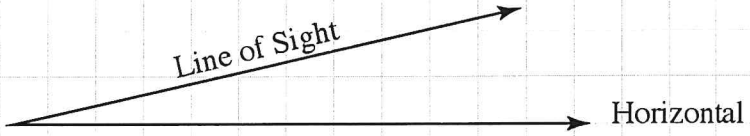
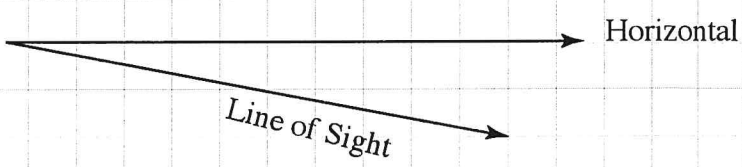
Ex. 3. From a point 400 ft. from the base of the TransAmerica pyramid in San Francisco, the angle of elevation to the top of the pyramid is found to be 64°53'. Find the height of the pyramid to the nearest foot.

The Angle of Elevation:



Ex. 4. An observer in a castle tower 300 feet above level ground notices an approaching army and finds that the angle of depression to the army is 3°27'. Find the distance from the army to the observer to the nearest foot.

The Angle of Depression:



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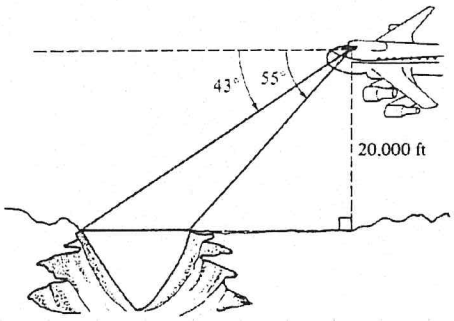
Ex. 5. An airplane is flying toward a canyon. From the plane, the angle of depression to the near side of the canyon is 55° and the angle of depression to the far side is 43°. If the altitude of the plan is 20,000 feet, then what is the distance across the canyon to the nearest foot?

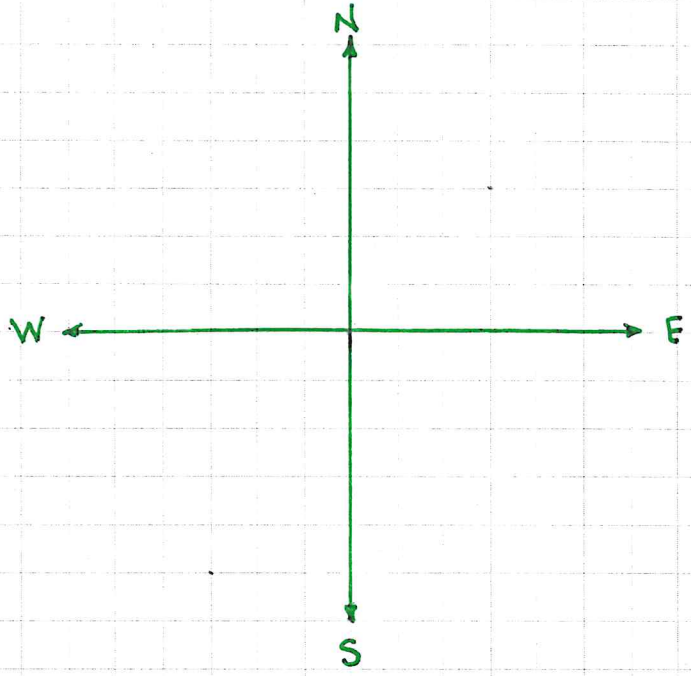


Ex. 6. From the roof of a building 200 feet from a line through the center of the Empire State Building, the angle of elevation to the top of the ESB is 36° while the angle of depression to its base is 79.7°. Find the height of the ESB to the nearest foot.

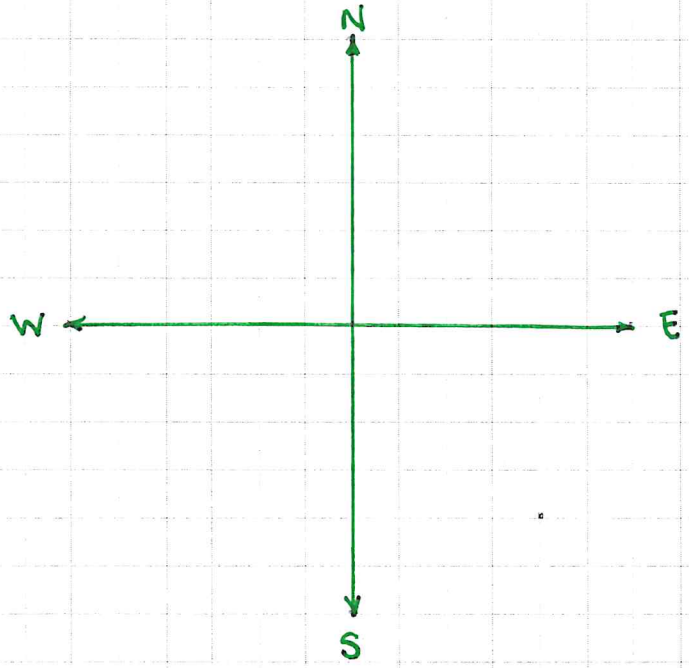
Specifying Direction

There are two common methods used for specifying direction.

I) Bearing



II) Heading



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Ex. 7. A plane leaves an airport flying at 365 miles per hour on a heading of 35°. To the nearest mile, how far north and east will the plane be from the airport after two hours?

Ex. 8. Two coastal observers located at points A and B ten miles apart spot a submarine offshore. If A is located directly north of B and the bearings to the submarine from A and B are S58°E and N32°E respectively, then find the following distances to the nearest tenth of a mile.

a) The distance from the submarine to point A .

b) The distance from the submarine to the shore .

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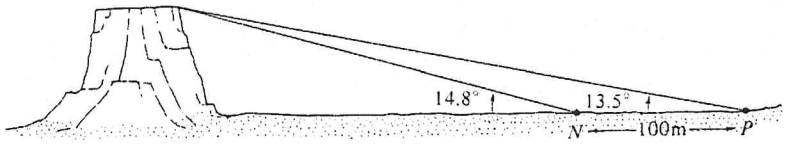
Ex. 9. A plane is 160 miles north and 85 miles west of an airport. At what heading should the pilot fly to return directly to the aiport, to the nearest tenth of a degree?

Ex. 10. In the movie *Close Encounters of the Third Kind*, Devil's Tower in Wyoming figured prominently. There was a scene in which the star, Richard Dryfuss was approaching the tower. He could have determined his distance from the tower by stopping at point P and estimating the angle P as shown in the picture. After moving 100 meters toward Devil's Tower, he could estimate the angle N as shown.



a) How far away from Devil's Tower is point N?

b) How tall is Devil's Tower?