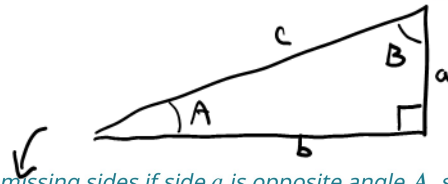


# CLASS 20 (First Part)

9.  ~~$\tan\left(\frac{\pi}{4}\right) = \cot(\_)$~~



For the following exercises, find the lengths of the missing sides if side  $a$  is opposite angle  $A$ , side  $b$  is opposite angle  $B$ , and side  $c$  is the hypotenuse.

10.  $\cos B = \frac{4}{5}, a = 10$

11.  $\sin B = \frac{1}{2}, a = 20$

12.  $\tan A = \frac{5}{12}, b = 6$

13.  $\tan A = 100, b = 100$

14.  $\sin B = \frac{1}{\sqrt{3}}, a = 2$

15.  $a = 5, \angle A = 60^\circ$

16.  $c = 12, \angle A = 45^\circ$

## Graphical

For the following exercises, use [Figure 14](#) to evaluate each trigonometric function of angle  $A$ .

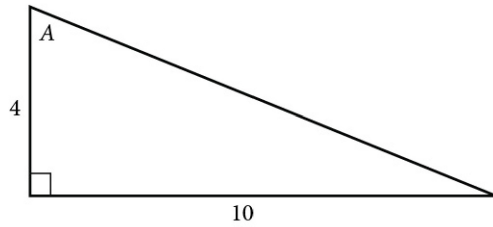


Figure 14

17.  $\sin A$

18.  $\cos A$

19.  $\tan A$

20.  $\csc A$

21.  $\sec A$

22.  $\cot A$

For the following exercises, use [Figure 15](#) to evaluate each trigonometric function of angle  $A$ .

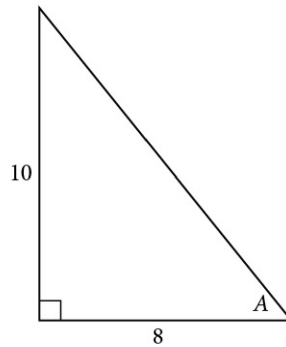


Figure 15

23.  $\sin A$

24.  $\cos A$

25.  $\tan A$

26.  $\csc A$

27.  $\sec A$

28.  $\cot A$

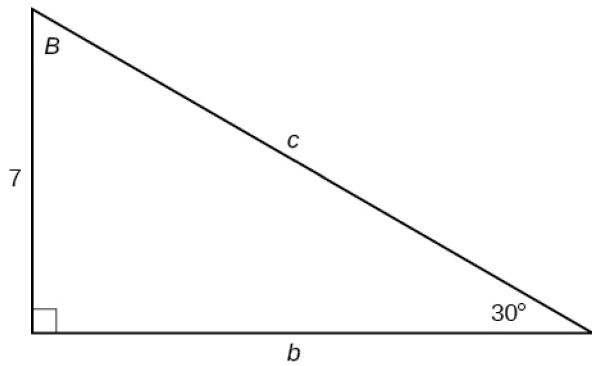
Extra

#2

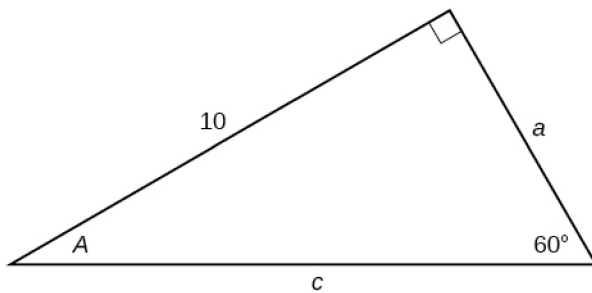
#3

*For the following exercises, solve for the unknown sides of the given triangle.*

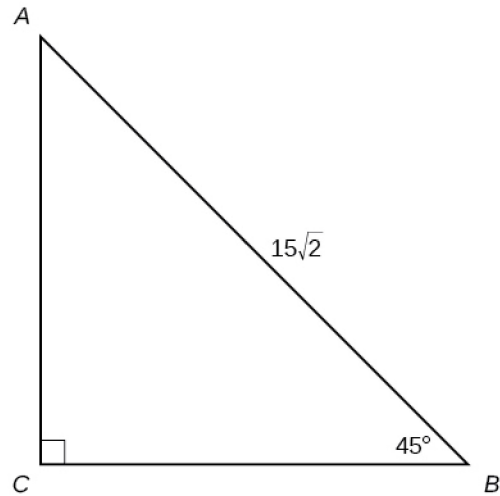
29.



30.



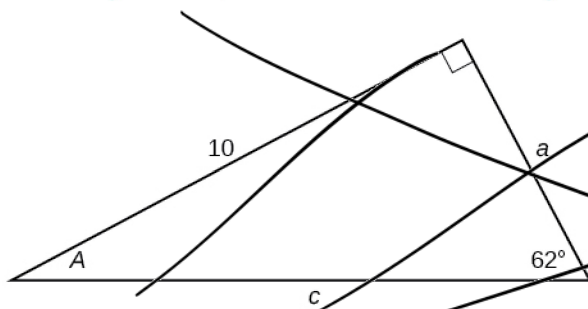
31.



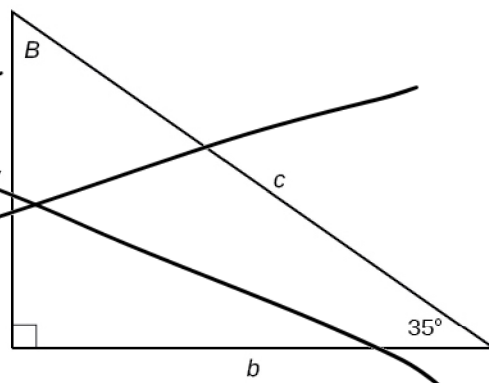
### Technology

*For the following exercises, use a calculator to find the length of each side to four decimal places.*

32.



33.



- 46.** A radio tower is located 400 feet from a building. From a window in the building, a person determines that the angle of elevation to the top of the tower is  $36^\circ$ , and that the angle of depression to the bottom of the tower is  $23^\circ$ . How tall is the tower?
- 47.** A radio tower is located 325 feet from a building. From a window in the building, a person determines that the angle of elevation to the top of the tower is  $43^\circ$ , and that the angle of depression to the bottom of the tower is  $31^\circ$ . How tall is the tower?
- 48.** A 200-foot tall monument is located in the distance. From a window in a building, a person determines that the angle of elevation to the top of the monument is  $15^\circ$ , and that the angle of depression to the bottom of the tower is  $2^\circ$ . How far is the person from the monument?
- 49.** A 400-foot tall monument is located in the distance. From a window in a building, a person determines that the angle of elevation to the top of the monument is  $18^\circ$ , and that the angle of depression to the bottom of the monument is  $3^\circ$ . How far is the person from the monument?
- 50.** There is an antenna on the top of a building. From a location 300 feet from the base of the building, the angle of elevation to the top of the building is measured to be  $40^\circ$ . From the same location, the angle of elevation to the top of the antenna is measured to be  $43^\circ$ . Find the height of the antenna.
- 51.** There is lightning rod on the top of a building. From a location 500 feet from the base of the building, the angle of elevation to the top of the building is measured to be  $36^\circ$ . From the same location, the angle of elevation to the top of the lightning rod is measured to be  $38^\circ$ . Find the height of the lightning rod.

### Real-World Applications

- 52.** A 33-ft ladder leans against a building so that the angle between the ground and the ladder is  $80^\circ$ . How high does the ladder reach up the side of the building?
- 53.** A 23-ft ladder leans against a building so that the angle between the ground and the ladder is  $80^\circ$ . How high does the ladder reach up the side of the building?
- 54.** The angle of elevation to the top of a building in New York is found to be 9 degrees from the ground at a distance of 1 mile from the base of the building. Using this information, find the height of the building.
- 55.** The angle of elevation to the top of a building in Seattle is found to be 2 degrees from the ground at a distance of 2 miles from the base of the building. Using this information, find the height of the building.
- 56.** Assuming that a 370-foot tall giant redwood grows vertically, if I walk a certain distance from the tree and measure the angle of elevation to the top of the tree to be  $60^\circ$ , how far from the base of the tree am I?