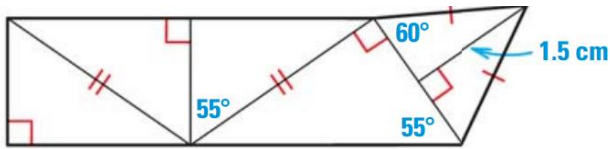
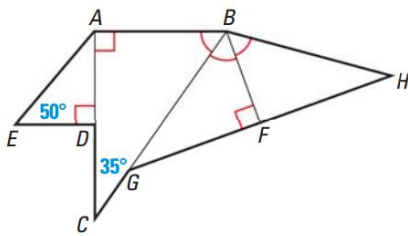


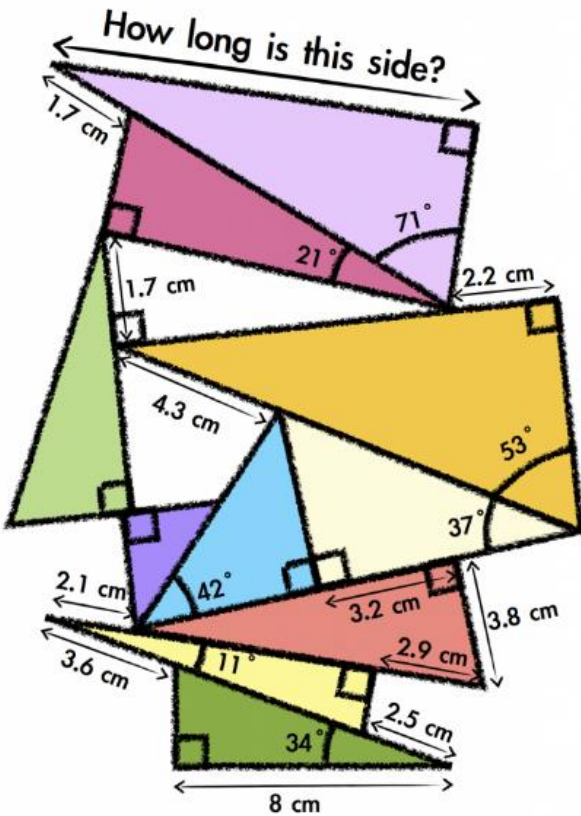
1. Approximate the perimeter of the figure below.



2. Find the perimeter of the figure below, where $AC=26$, $AD=BF$, and D is the midpoint of \overline{AC} .



3. Find the top length of the stack of right triangles. (Hint: Start from the bottom)



4. A 625 foot long wire is attached to the top of a tower and is connected to the ground. If the wire makes an angle of 65° with the ground, how tall is the tower?

5. Batman is standing on the top of a building making sure crime is silenced. He spots his enemy, the Joker, up to no good. Batman's angle of depression from the top of the building to the Joker who is on the ground is 38° . The height of the building is 456 feet. Help Batman capture the Joker by calculating the Joker's distance from the bottom of the building.

6. A damsel is in distress and is being held captive in a tower. Her knight in shining armor is on the ground below with a ladder. When the knight stands 15 feet from the base of the tower and looks up at his precious damsel, the angle of elevation to her window is 60° . How long does the ladder have to be in order for the knight to rescue her?

7. Suppose you are flying a kite and it gets caught at the top of the tree. You've let out all 100 feet of string for the kite, and the angle that the string makes with the ground is 75 degrees. Instead of worrying about how you are going to get your kite back, you first wonder "how tall is that tree"?

8. You are standing on the top of a cliff that is 30 feet above the ocean. You see a sailboat down in the water below. The angle of depression that you spot the sailboat at is 34° . How far from the base of the cliff is the boat?

9. Julie is 6 feet tall. If she stands 15 feet from the base of a flagpole and looks up to the top of the flagpole at an angle of 47° , how tall is the flagpole?

10. The pilot of an airplane finds the angle of depression of an airport to be 16° . If the altitude of the plane is 6,000 meters, find the horizontal distance to the airport.

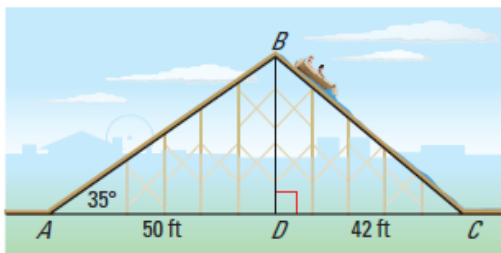
11. In isosceles triangle ABC, find the length of the altitude drawn to the base BC if $BC=20$ and $m\angle B = 35^\circ$

12. From the foot of a building, I have to look upwards at an angle of 22° to see the top of a tree. From the top of a building 150 meters tall, I have to look down at an angle of depression of 50° to look at the top of the tree. How tall is the tree? How far apart are the building and the tree?

13. At a point 200 feet from the base of a building, the angle of elevation to the bottom of a smokestack located on the top of the building is 35° . The angle of elevation to the top of the same smokestack is 53° . Find the height of the smokestack.

14. A helicopter is hovering 800 feet above a road. A truck driver observes the helicopter at a 20° angle. Twenty five seconds later, the truck driver notices that the angle to the helicopter is now at 65° . How far did the truck move in those 25 seconds?

15. The design for part of a water ride at an amusement park is shown. How high is the ride above point D? What is the total distance from point A to point B to point C? Round to the nearest tenth.



Answers: 1) 14 cm 2) 128 units 3) 12.1 cm 4) 566.4 ft 5) 583.7 ft 6) 30 ft 7) 96.6 ft

8) 44.5 ft 9) 22.1 ft 10) 20,924.5 m 11) 7 units 12) 38 ft, 94 ft 13) 125.4 ft 14) 1824.8 ft

15) $BD=35$ ft, $A \rightarrow B \rightarrow C=115.7$ ft