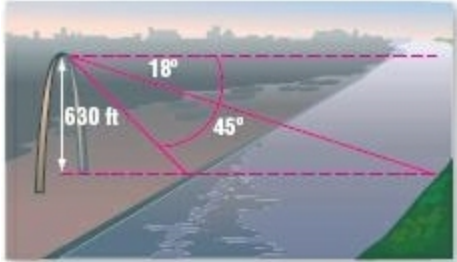


8-5 Angles of Elevation and Depression

11. **RIVERS** Hugo is standing in the top of St. Louis' Gateway Arch, looking down on the Mississippi River. The angle of depression to the closer bank is 45° and the angle of depression to the farther bank is 18° . The arch is 630 feet tall. Estimate the width of the river at that point.



ANSWER:

about 1309 ft

12. **CCSS MODELING** The Unzen Volcano in Japan has a magma reservoir that is located 15 kilometers beneath the Chijiwa Bay, located east of the volcano. A magma channel, which connects the reservoir to the volcano, rises at a 40° angle of elevation toward the volcano. What length of magma channel is below sea level?

ANSWER:

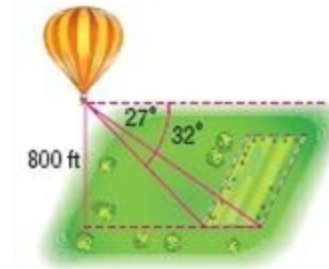
23.3 km

14. **LIGHTHOUSES** To aid in navigation, Little Gull Island Lighthouse shines a light from a height of 91 feet with a 6° angle of depression. Plum Island Lighthouse, 1800 feet away, shines a light from a height of 34 feet with a 2° angle of depression. Which light will reach a boat that sits exactly between Little Gull Island Lighthouse and Plum Island Lighthouse?

ANSWER:

Little Gull Island Lighthouse has a span of 866 ft, and Plum Island Lighthouse has a span of 974 ft. So, the light from Plum Island Lighthouse would reach the boat.

18. **CCSS MODELING** As a part of their weather unit, Anoki's science class took a hot air balloon ride. As they passed over a fenced field, the angle of depression of the closer side of the fence was 32° , and the angle of depression of the farther side of the fence was 27° . If the height of the balloon was 800 feet, estimate the width of the field.



ANSWER:

289.8 ft