

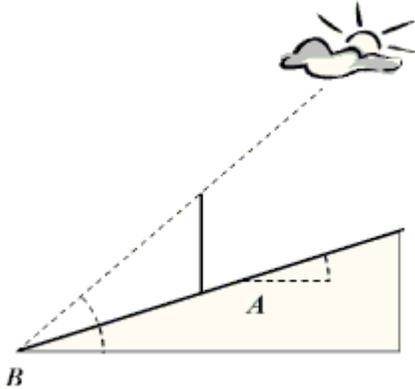
Exam 8 Study Guide

Exam 8 will be administered on Friday March 8. It will have a total of 9 free response questions. Calculators are allowed on the exam. The Study guide will help you focus on specific topics that will be found on the exam. Provided are additional real-life problems along with the answers on page 4.

Topic	Practice Exercises	Number of Test Questions
Find the Area of a triangle using the Area of an Oblique Triangle Formula	Section 6.1 Exc 19-24	1
Find the Area of a triangle using Heron's Area Formula	Section 6.2 Exc 27-36	1
Use the Law of Sines to model and solve real-life problems	Section 6.1 Exc 25-35 See Attached Practice Problems	2
Use the Law of Cosines to model and solve real-life problems	Section 6.2 Exc 37-47 See Attached Practice Problems	1
Find a unit vector in the direction of a given vector	Section 6.3 Exc 35-44	1
Find a vector with a particular magnitude in the direction of a given vector	Section 6.3 Exc 45-50	1
Find the component form of a vector given it's magnitude and direction angle	Section 6.3 Exc 67-72	1
Find the angle between two vectors	Section 6.4 Exc 17-24	1
Find the projection of one vector onto another vector	Section 6.4 Exc 45-48	1

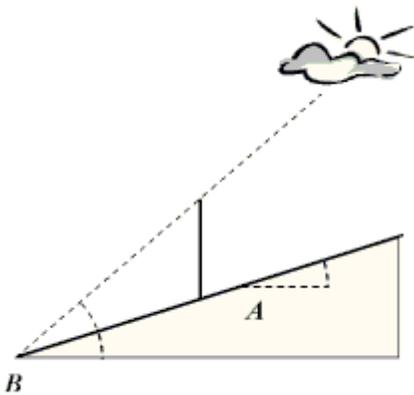
1. To find the distance between two points, A and B , that lie on opposite sides of the Potomac River, a surveyor lays off a line segment, AC , of length 150 yards along the same bank as point A . He determines that the measure of the angle at A is $62^{\circ}39'$ and the measure of the angle at C is $54^{\circ}15'$. Determine the distance from point A to point B . Round answer to two decimal places.

- A park ranger at point A observes a fire in the direction $N30^\circ42'E$. Another ranger at point B , 9 miles due east of A , sites the same fire at $N51^\circ41'W$. Determine the distance from point B to the fire. Round answer to two decimal places.
- A straight road makes an angle, A , of 17° with the horizontal. When the angle of elevation, B , of the sun is 51° , a vertical pole beside the road casts a shadow 8 feet long parallel to the road. Approximate the length of the pole. Round answer to two decimal places.



- After a severe storm, three sisters, April, May, and June, stood on their front porch and noticed that the tree in their front yard was leaning 3° from vertical toward the house. From the porch, which is 99 feet away from the base of the tree, they noticed that the angle of elevation to the top of the tree was 29° . Approximate the height of the tree. Round answer to two decimal places.
- A vertical pole 21 feet tall stands on a hillside that makes an angle of 18° with the horizontal. Determine the approximate length of cable that would be needed to reach from the top of the pole to a point 68 feet downhill from the base of the pole. Round answer to two decimal places.
- Two automobiles leave from the same point in Chicago at the same time and travel along straight highways that differ by 64° . If their speeds are 55 mi/hr and 80 mi/hr, respectively, determine how far apart the cars are after 33 minutes. Round answer to two decimal places.

7. Two ocean liners leave from the same port in Puerto Rico at 10:00 a.m. One travels at a bearing of $N49^\circ W$ at 13 miles per hour, and the other travels at a bearing of $S55^\circ W$ at 14 miles per hour. Approximate the distance between them at noon the same day. Round answer to two decimal places.
8. To find the distance between two points, A and B , that lie on opposite sides of the Potomac River, a surveyor lays off a line segment, AC , of length 115 yards along the same bank as point A . He determines that the measure of the angle at A is $60^\circ 29'$ and the measure of the angle at C is $55^\circ 31'$. Determine the distance from point A to point B . Round answer to two decimal places.
9. A park ranger at point A observes a fire in the direction $N28^\circ 18' E$. Another ranger at point B , 9 miles due east of A , sites the same fire at $N58^\circ 26' W$. Determine the distance from point B to the fire. Round answer to two decimal places.
10. A straight road makes an angle, A , of 11° with the horizontal. When the angle of elevation, B , of the sun is 56° , a vertical pole beside the road casts a shadow 6 feet long parallel to the road. Approximate the length of the pole. Round answer to two decimal places.



11. After a severe storm, three sisters, April, May, and June, stood on their front porch and noticed that the tree in their front yard was leaning 7° from vertical toward the house. From the porch, which is 92 feet away from the base of the tree, they noticed that the angle of elevation to the top of the tree was 26° . Approximate the height of the tree. Round answer to two decimal places.

12. A vertical pole 40 feet tall stands on a hillside that makes an angle of 15° with the horizontal. Determine the approximate length of cable that would be needed to reach from the top of the pole to a point 75 feet downhill from the base of the pole. Round answer to two decimal places.

13. Two automobiles leave from the same point in Chicago at the same time and travel along straight highways that differ by 74° . If their speeds are 56 mi/hr and 79 mi/hr, respectively, determine how far apart the cars are after 23 minutes. Round answer to two decimal places.

14. Two ocean liners leave from the same port in Puerto Rico at 10:00 a.m. One travels at a bearing of $N45^\circ W$ at 11 miles per hour, and the other travels at a bearing of $S56^\circ W$ at 12 miles per hour. Approximate the distance between them at noon the same day. Round answer to two decimal places.

Answer Key

1. $AB = 136.51$ yards
2. 7.81 miles
3. 7.11 feet
4. 53.40 feet
5. 77.12 feet
6. 41.04 miles
7. 33.28 miles
8. $AB = 105.47$ yards
9. 7.94 miles
10. 7.59 feet
11. 42.65 feet
12. 93.69 feet
13. 31.93 miles
14. 29.30 miles