

4.4 Problems in 2-Dimensions Worksheet

MCR3U

Jensen

1) For each of the following, select the most appropriate trigonometric tool among primary trig ratios, sine law, and cosine law. Then use that tool to find the indicated unknown quantity. Round answer to 1 decimal place.

- a) In $\triangle ABC$, $\angle A = 90^\circ$, $\angle B = 39^\circ$, and $a = 10$ cm. Determine b .
- b) In $\triangle PQR$, $\angle P = 35^\circ$, $\angle R = 65^\circ$, and $p = 3$ m. Determine q .
- c) In $\triangle DEF$, $\angle D = 60^\circ$, $\angle F = 65^\circ$, and $d = 12$ cm. Determine f .
- d) In $\triangle XYZ$, $\angle X = 42^\circ$, $y = 25$ km and, and $z = 20$ km. Determine x .

2) The shadow of a tree that is 12 meters tall measures 9 meters in length. Determine the angle of elevation of the sun.



3) There is a water hazard between a golfer's ball and the green. The golfer has two choices. He can hit the ball alongside the water hazard to a point left of the green and play the next shot from there. Or, he can hit directly over the water hazard to the green. The golfer can usually hit an approach shot at least 60 meters. Should he attempt the direct shot, or go around the hazard?



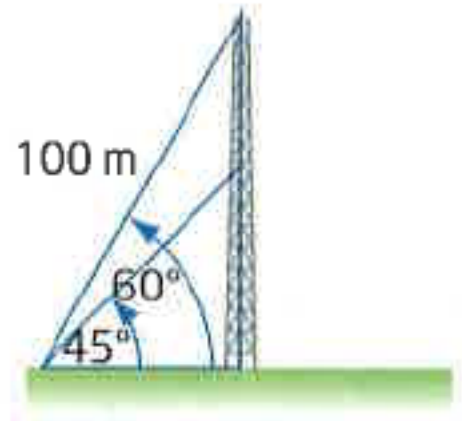
4) Yolanda flies her ultra-light airplane due east for 100 km. She turns right through an angle of 130° , and flies a second leg. Then, she turns right 110° and returns to her starting point.

- a) Represent the flight path using an appropriate diagram, labeling all information.
- b) Determine the total length of the flight, to the nearest km.

5) Find an exact expression for the distance between Bill and Nadia's houses.



6) A radio antenna is stabilized by two guy wires. One guy wire is 100 m in length and is attached to the top of the antenna. The wire makes an angle of 60° with the ground. One end of the second guy wire is attached to the ground at the same point as the first guy wire. The other end is attached to the antenna such that the wire makes an angle of 45° with the ground. Determine an exact expression for the distance between the points where the two guy wires are attached to the antenna.



7) A Ferris wheel has a radius of 20 m, with 10 cars spaced around the circumference at equal distances. If the cars are numbered in order, how far is it directly from the first car to the fifth car?

Answers

1) a) 6.3 cm b) 5.2 m c) 12.6 cm d) 16.8 km

2) 53°

3) 67 m. He should go for the direct shot.

4) a)  b) 274 km

5) $20\sqrt{181 + 90\sqrt{2}}$ m.

6) $50(\sqrt{3} - 1)$ m.

7) approximately 38 m.