

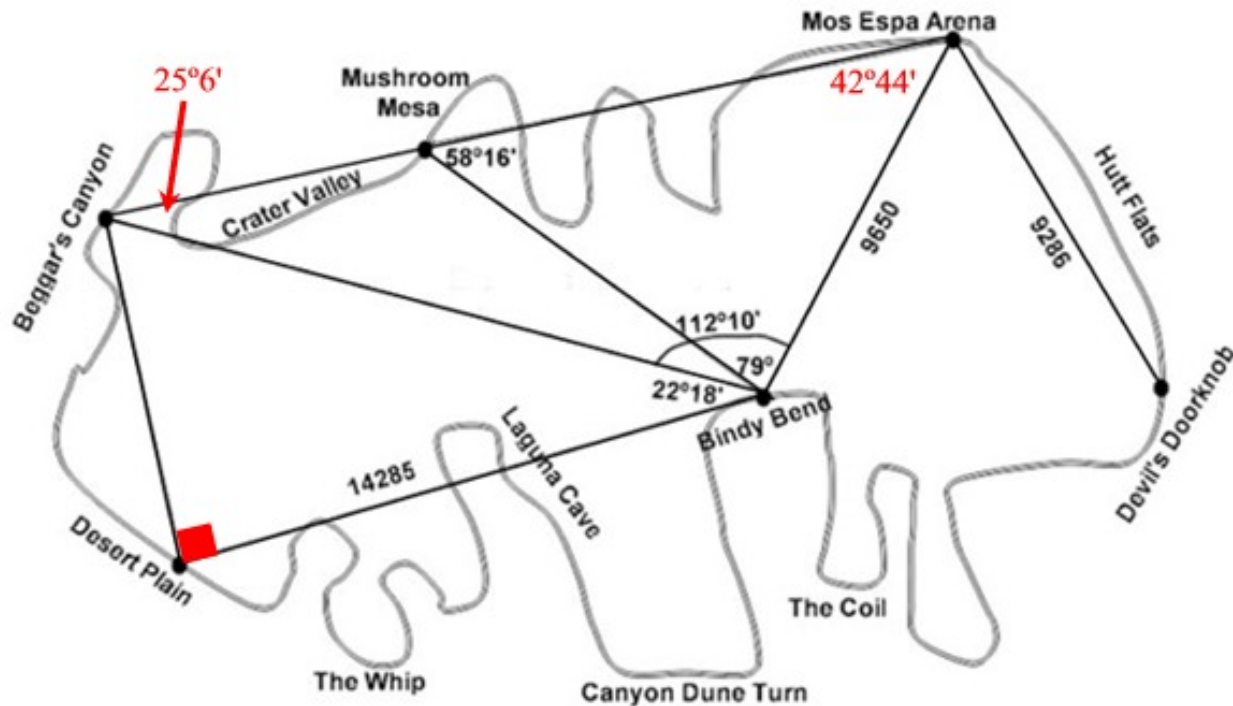
# Pod Racing Worksheet

Trigonometry

Name ANSWER KEY

Other solutions are also possible.

Pod racing is a fictional sport seen in the movie *Star Wars Episode I: The Phantom Menace*. Against enormous odds, young Anakin Skywalker wins the Boonta Eve Classic Pod Race on the Mos Espa pod racing circuit. Below is a simulated drawing of the Mos Espa pod racing circuit. (An actual drawing of the Mos Espa circuit can be found in *Inside the World of Star Wars Episode I* by Kristin Lund.)



The Star Wars pod race was won by Anakin Skywalker traveling at an average speed of 536 miles per hour. Six other racers also finished the race. Numerous other racers also started the race but did not finish due to mechanical problems, collisions, crashes, vaporizations or disappearances. (Pod race information can be found in *Inside the World of Star Wars Episode I* by Kristin Lund or at Wikipedia.)

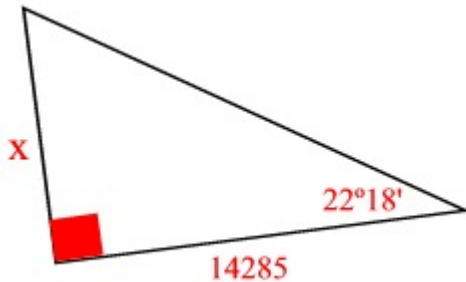
**Pod Racing Worksheet Directions:** Each of the following problems is based upon the simulated pod race circuit seen above. Answers are to be rounded to the *nearest foot*, unless stated otherwise. It may be necessary to use the rounded answers from previous problems to find the solutions to questions 2 and 3. Be sure to show all work.

May the Force be with you!!!

**Pod Racing Worksheet Questions:**

1. Tonto Pagalies (brother to vaporized racer Teento), an observer at Bindy Bend, is 14285' from Dessert Plain. He knows that there is a right angle between the lines of sight from Bindy Bend to Dessert Plain and from Dessert Plain to Beggar's Canyon. He also observes the angle between Dessert Plain and Beggar's Canyon to be  $22^{\circ}18'$ .

a) Find the line of sight distance from Dessert Plain to Beggar's Canyon.

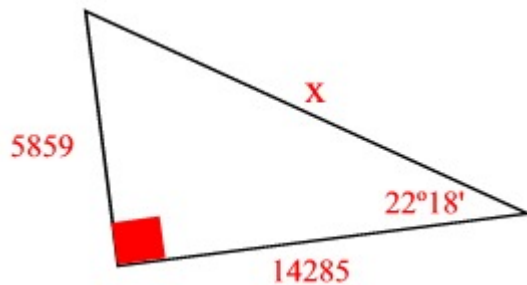


$$\tan 22^{\circ}18' = \frac{x}{14285}$$

$$x = 5858.705471$$

$$x = 5859 \text{ feet}$$

b) Find the line of sight distance from Beggar's Canyon to Bindy Bend.  
(Several methods of solution.)



Pythagorean Theorem

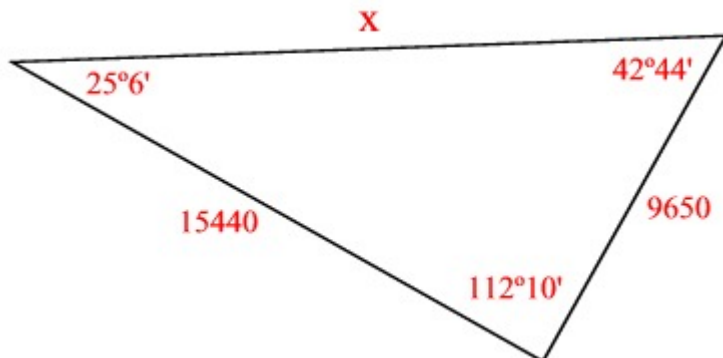
$$x^2 = 5859^2 + 14285^2$$

$$x = 15439.85447$$

$$x = 15,440 \text{ feet}$$

2. On the map, the distance from Bindy Bend to Mos Espa Arena is 9650', and the lines of sight from Bindy Bend to Beggar's Canyon and from Bindy Bend to Mos Espa Arena make an angle of  $112^{\circ}10'$ .

Find the line of sight distance from Beggar's Canyon to Mos Espa Arena using **Law of Cosines**.



Law of Cosines

$$x^2 = 15440^2 + 9650^2 - 2 \cdot 15440 \cdot 9650 \cdot \cos 112^{\circ}10'$$

$$x = 21070.09965$$

$$x = 21,070 \text{ feet}$$

If a student uses Law of Sines, note the slight difference in the answer due to rounding.

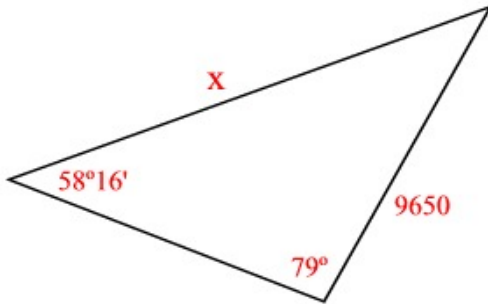
$$\frac{x}{\sin 112^{\circ}10'} = \frac{9650}{\sin 25^{\circ}6'}$$

$$x = 21067.38106$$

$$x = 21,067 \text{ feet}$$

3. Notice on the map that Mushroom Mesa is on the line of sight from Beggar's Canyon to Mos Espa Arena. Tonto, still sitting at Bindy Bend, observes the angle of sight between Mushroom Mesa and Mos Espa Arena to be  $79^\circ$ . His friend, Mawhonic, -- who crashed at Mushroom Mesa on the first lap -- observes the angle of sight between Mos Espa Arena and Bindy Bend to be  $58^\circ 16'$ .

- a) Find the line of sight distance from Mushroom Mesa to Mos Espa Arena.



Law of Sines

$$\frac{x}{\sin 79^\circ} = \frac{9650}{\sin 58^\circ 16'}$$

$$x = 11137.73516$$

$$x = 11,138 \text{ feet}$$

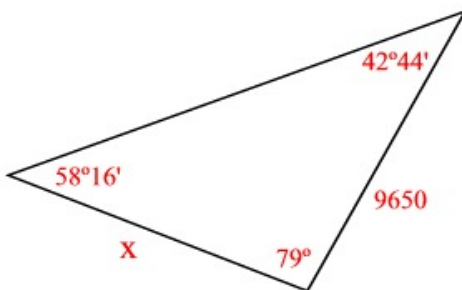
- b) Find the line of sight distance from Beggar's Canyon to Mushroom Mesa.

$$21070$$

$$\underline{-11138}$$

$$9932 \text{ feet}$$

- c) Find the line of sight distance from Mushroom Mesa to Bindy Bend, using **Law of Sines**.



Law of Sines

$$\frac{x}{\sin 42^\circ 44'} = \frac{9650}{\sin 58^\circ 16'}$$

$$x = 7699.382875$$

$$x = 7699 \text{ feet}$$

4. As the pod racers pass through Devil's Doorknob (flying perpendicular to the ground), they encounter a long straightaway to Mos Espa Arena, across Hutt Flats, a distance of 9286'. On Lap 1, Neva Kee covered this distance in exactly 6 seconds. Find the speed at which Neva Kee was traveling, in miles per hour. (This answer might also explain what happened on lap 2, when he left the circuit, and is still missing!)

**Method 1**

3600 seconds in one hour

5280 feet in one mile

$$\frac{6}{3600} = \frac{9286}{x}$$

$$x = 5571600 \text{ feet per hour}$$

$$x = 1055.227273 \text{ miles per hour}$$

$$x = 1055 \text{ mph}$$

**Method 2**

$$\frac{9286}{5280} = 1.75871212 \text{ miles per 6 seconds}$$

$$1.75871212 \cdot 10 \cdot 60 = 1055.227273$$

$$1055 \text{ mph}$$