




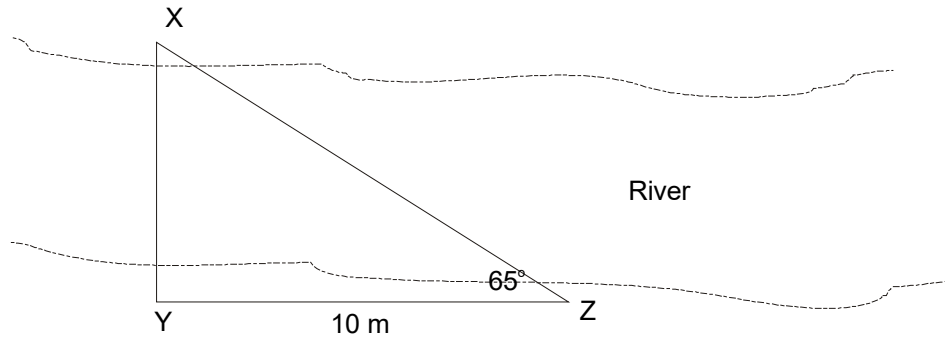
Trigonometry

Source: Government of BC used with permission.





4. Marianne wants to know how far it is across a river. She notices a tree at point X straight across from point Y. She walks 10 m along the river bank to point Z and observes that the angle to the tree is 65° . What is the distance across the river from point X to point Y to the nearest hundredth of a metre?



5. A plot of land has the shape of a right triangle. The longest side is 37 m and lies at an angle of 53° to the shortest side. Find the area of the plot to the nearest square metre.

ANSWER KEY

1. 12.5 m
2. 75 m
3. 11°
4. 21.45 m
5. 329 m^2

Source: Government of BC used with permission.

3. Joan is welding a piece of modern sculpture. Part of the design includes an A-frame structure. Joan wants the two thin bars that make up the sides of the frame to form an angle of 54° at the top and she wants the frame to be 2.2 m high. How long will each bar have to be to the nearest thousandth? (Hint: you need a right triangle to use a trigonometric ratio.)
4. A new ski-lift is being built at the slopes. The base of the lift is at an elevation of 2500 m, but the elevation of the top station is not accurately known. A survey of the site shows the base and the top station are 2450 m apart in horizontal distance and a line of sight to the top station angles up at 38° . Find the length of steel cable (to the nearest 10 m) that will be needed for the endless loop on which the chairs will hang. Allow for an additional 5% of the total length for sags, joining, etc.
5. The roof of a small pup tent is made of a rectangular piece of material. If the tent is to be 2.2 m long, the roof sloping up at 48° to the horizontal and with the poles 1.4 m high, how many square metres of material will be needed to make the tent to the nearest hundredth?

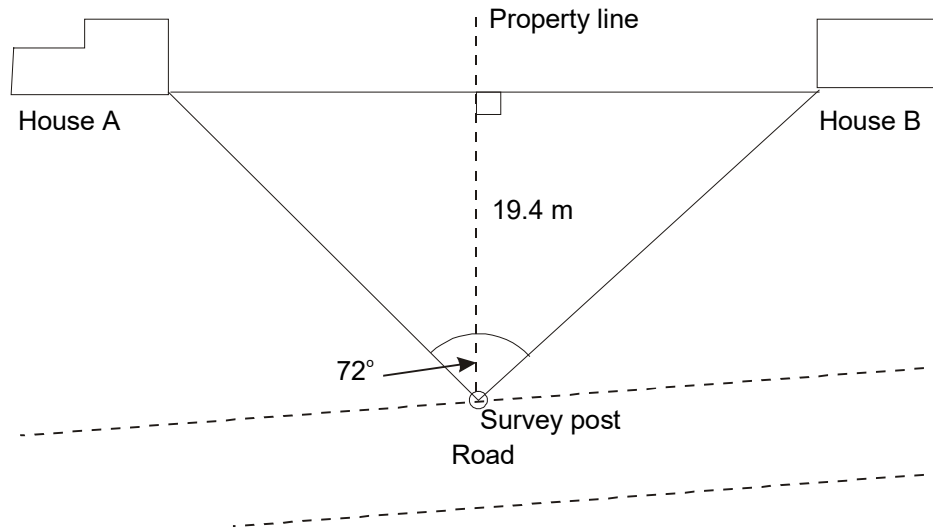
ANSWER KEY

1. 4.2 m
2. roof beams are 3.73 m long, slope is 9°
3. 2.469 m
4. 6530 m
5. 8.27 m^2

Source: Government of BC used with permission.

TRIGONOMETRY 3

- Given that the property line is halfway between the two houses on the plan below, what is the distance between the two houses to the nearest tenth of a metre?



- How far is the corner of house B from the survey post to the nearest tenth of a metre?
- A carpenter is instructed to cut a right-angled wooden wedge 25 cm long in the base with an angle of 12° . How long will the sloping surface of the wedge be to the nearest millimetre?

4. From a ladder, Wayne looks at a building 35 m away. He notes that the angle of elevation to the top of the building is 19° and the angle of depression to the bottom of the building is 7° . How high is the building?
5. A slide in the Water Park is 9 m high. If the actual length of the slide is 14 m, what angle does the slide make with the horizontal?

ANSWER KEY

1. 28.2 m
2. 24.1 m
3. 256 mm
4. 16.3 m
5. 40°

Source: Government of BC used with permission.

TRIGONOMETRY 4

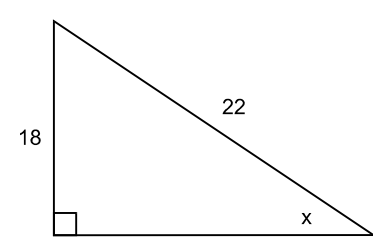
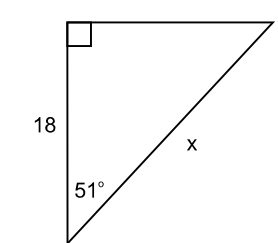
1. Find the following. Round answers to 4 decimal places.

- a. $\cos 82^\circ$ _____
- b. $\tan 5.6^\circ$ _____
- c. $\sin 0.77^\circ$ _____

2. Find $\angle A$ (in degrees) for each of the following. Round to one decimal place.

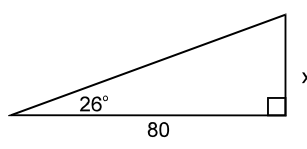
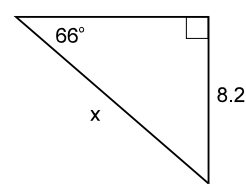
- a. $\sin \angle A = 0.9321$ _____
- b. $\tan \angle A = 2.563$ _____
- c. $\cos \angle A = 0.089$ _____

3. Find $\angle x$ or side x in each of the following. Round answers to one decimal place.

a.  b. 

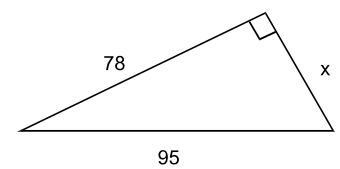
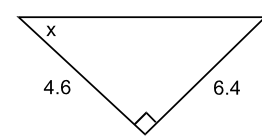
a. _____

b. _____

c.  d. 

c. _____

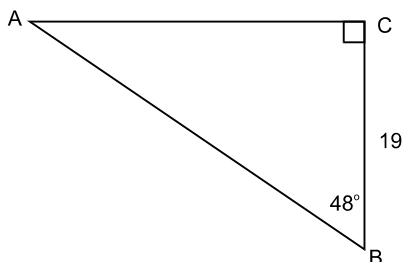
d. _____

e.  f. 

e. _____

f. _____

4. Solve $\triangle ABC$. Round your answers to one decimal place.



$$\overline{AC} = \underline{\hspace{2cm}}$$

$$\overline{AB} = \underline{\hspace{2cm}}$$

$$\angle A = \underline{\hspace{2cm}}$$

5. Vicki estimates the distance from a large rock to the base of a vertical cliff to be 43 m. Standing by the large rock, the angle between the ground and her line of sight to the top of the cliff is about 57° . Estimate the height of the cliff.

$$\text{Height of the cliff} = \underline{\hspace{2cm}}$$

6. What angle does a 7.5 m ladder make with a wall if the top of the ladder is 6 m above the ground?

$$\text{Angle of the ladder} = \underline{\hspace{2cm}}$$

ANSWER KEY

1. a. 0.1392 b. 0.0981 c. 0.0134
2. a. 68.8° b. 68.7° c. 84.9°
3. a. 54.9° b. 28.6 c. 39.0 d. 9.0 e. 54.2
f. 54.3°
4. a. 21.1 b. 28.4 c. 42°
5. 66.2 m
6. 36.9°

Source: Government of BC used with permission.

TRIGONOMETRY 5

1. Find the following: Round your answers to 4 decimal places.

a. $\sin 16^\circ$

b. $\tan 80.5^\circ$

c. $\cos 0.3^\circ$

2. Find $\angle A$ (in degrees) for each of the following. Round your answer to one decimal place.

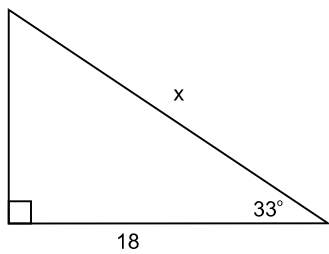
a. $\tan \angle A = 1.093$

b. $\sin \angle A = 0.5555$

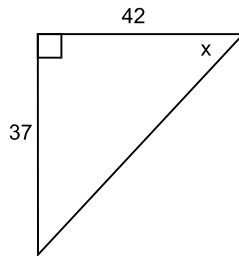
c. $\cos \angle A = 0.065$

3. Find $\angle x$ or side x in each of the following. Round your answers to one decimal place.

a.



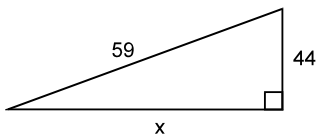
b.



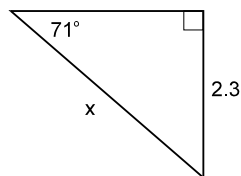
a. _____

b. _____

c.



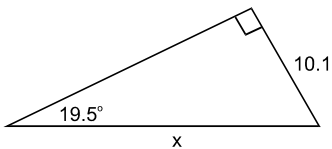
d.



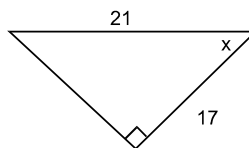
c. _____

d. _____

e.



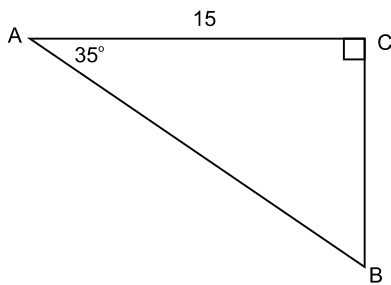
f.



e. _____

f. _____

4. Solve $\triangle ABC$. Round your answers to one decimal place.



$$\overline{AB} = \underline{\hspace{2cm}}$$

$$\overline{BC} = \underline{\hspace{2cm}}$$

$$\angle B = \underline{\hspace{2cm}}$$

5. A 6.5 m ladder makes an angle of 22° with a wall. How high up the wall does the ladder reach?
Round your answers to one decimal place.

$$\text{Height of the ladder} = \underline{\hspace{2cm}}$$

6. Bill is in an apartment building 58 m above the ground. In the distance he can see a tall tree. The angle between the building and his line of sight to the base of the tall tree is 85.5° . How far is the tree from the foot of the building?

$$\text{Distance to the tree} = \underline{\hspace{2cm}}$$

ANSWER KEY

1. a. 0.2756 b. 5.9758 c. 1.0000
2. a. 47.5° b. 33.7° c. 86.3°
3. a. 21.5 b. 41.4° c. 39.3 d. 2.4 e. 30.3
f. 36°
4. 18.3, 10.5, 55°
5. 6 m
6. 737

Source: Government of BC used with permission.

