

Chapters 5 and 6 deal with Trigonometry. A lot of it deals with exploring how points on a grid and angles work together. Another part of the chapter has us look back at our Grade 10 Trigonometry. For this Project Day, you will review that Trigonometry so that when you come back on Monday, you will already be immersed in the wonderful, exciting and beautiful world of Trig.

There are four parts:

1. Right Angled Trigonometry
2. Sine Law
3. Cosine Law
4. Applications

Part 1: Right Angled Trigonometry Review Notes (watch the video)

1. $\tan 78^\circ$

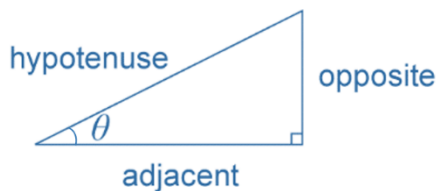
2. $\sin \theta = 0.3362$

Given a right angled triangle:

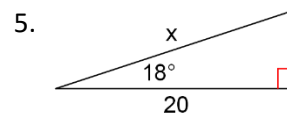
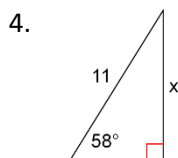
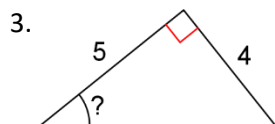
$\sin \theta =$

$\cos \theta =$

$\tan \theta =$

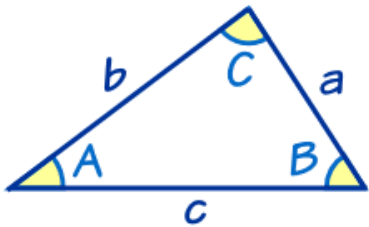


Find the missing angle or side.



Part 2: Sine Law Review Notes (watch the video)

Given the triangle, the formula for Sine Law is:



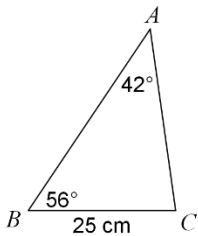
$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c} \quad \text{or}$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

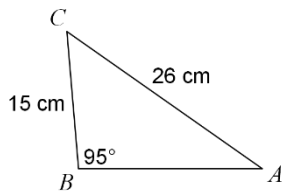
To use sine law, you need one complete ratio (an angle and its corresponding side) and one other piece of information. Use the formula that fits the situation, meaning put the unknown in the numerator.

Recall: All angles in a triangle add up to

1. Find AC



2. Find $m\angle A$



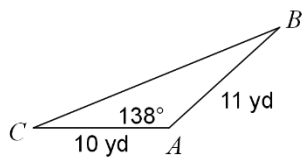
Part 2: Cosine Law Review Notes (watch the video)

If you have 2 sides and the angle connecting those sides or if you have all three side, the Sine Law will not work. This means we need to use Cosine Law! Here are the two formulas:

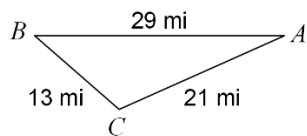
Missing side: $c^2 = a^2 + b^2 - 2ab \cos C$

Missing angle: $\cos \theta = \frac{c^2 - a^2 - b^2}{-2ab}$

1. Find BC



2. Find $m\angle C$

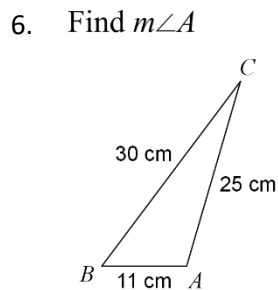
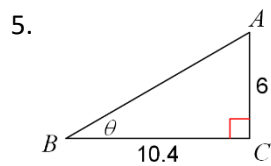
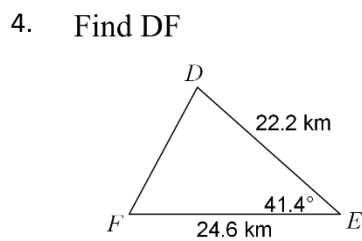
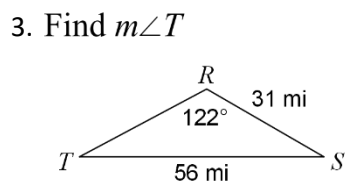
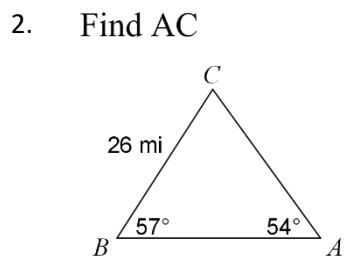
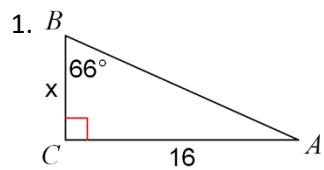


Part 4: Application (word problems) Note (watch the video)

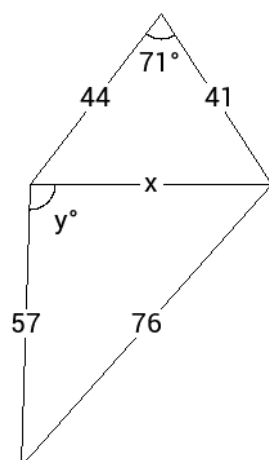
1. Susan and Jorge stand 38 m apart, both to the west of Big Ben. From Susan's position, the angle of elevation to the top of Big Ben is 65 degrees. From Jorge's position, the angle of elevation to the top of Big Ben is 50 degrees. To the nearest meter, how tall is Big Ben?

2. While golfing, Melanie hits a tee shot toward the hole, but the ball veers 23° and lands away from the hole. The scorecard says that the hole is 270 m from the tee. If Melanie walks 160 m to the ball, how far, to the nearest metre, is the ball from the hole?

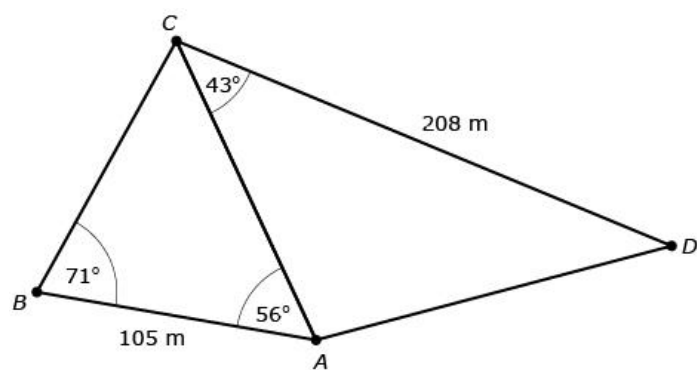
Answer the following questions. You will need to decide which rule to follow.



7. Solve for x and y .



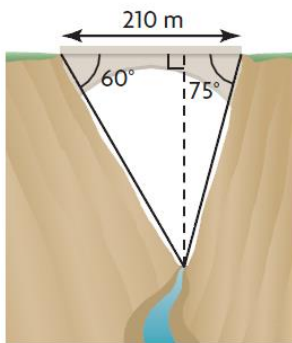
8. Find the distance from A to D.



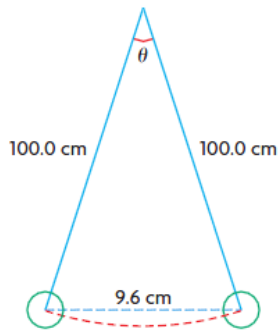
9. A wheelchair ramp near the door of a building has an incline of 15° and a run of 7.11m from the door. Calculate the length of the ramp to the nearest hundredth of a metre.

10. A telephone pole is supported by two wires on opposite sides. At the top of the pole, the wires together form an angle of 60° . On the ground, the ends of the wires are 15.0 m apart. One wire makes a 45° angle with the ground. How long are the wires, and how tall is the pole?

11. A bridge across a gorge is 210 m long, as shown in the diagram at the left. The walls of the gorge make angles of 60° and 75° with the bridge. Determine the depth of the gorge to the nearest metre.



12. The pendulum of a grandfather clock is 100.0 cm long. When the pendulum swings from one side to the other side, the horizontal distance it travels is 9.6 cm, as in the diagram. Determine the angle through which the pendulum swings. Round your answer to the nearest tenth of a degree.



13. Fred and Agnes are 520 m apart. As Brendan flies overhead in an airplane, they measure the angle of elevation of the airplane. Fred measures the angle of elevation to be 63° . Agnes measures it to be 36° . What is the altitude of the airplane?

14. Marion is observing the launch of a space shuttle from the command center. When she first sees the shuttle, the angle of elevation to it is 16 degrees. Later, the angle of elevation is 74 degrees. If the command center is 1.6 kilometres from the launch pad, how far did the shuttle travel while Marion was watching? Round to the nearest tenth of a mile.