

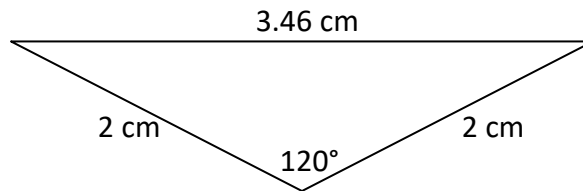
Essential Math 40S

Trigonometry Practice Test

KEY

Please answer the following questions in the space provided. Show all work where applicable. Round answers to **two decimal places** where rounding is required.

1. Examine the diagram of a triangle below and answer the questions which follow.



- a) Classify this triangle by the length of its sides. (Equilateral, Isosceles, or Scalene)

Isosceles

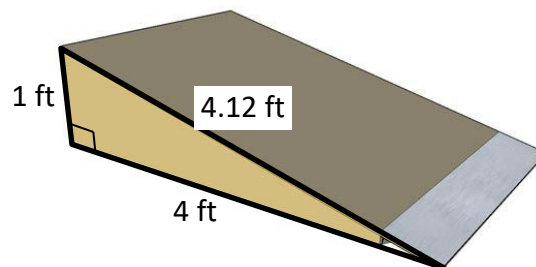
- b) Classify this triangle by the measure of its angles. (Right, Acute, Obtuse)

Obtuse

- c) Calculate the size of the base angles of the triangle.

$$180^\circ - 120^\circ = 60^\circ$$
$$60^\circ \div 2 = 30^\circ$$

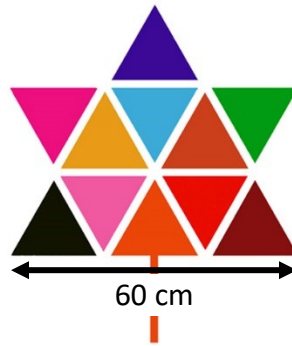
2. Your daughter wants to build a skateboard ramp. When viewed from the side, she wants the ramp to have the dimensions shown below.



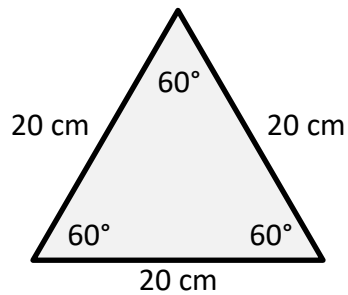
- a) Classify this triangle by the length of its sides: ***Scalene***

- b) Classify this triangle by the measure of its angles: ***Right***

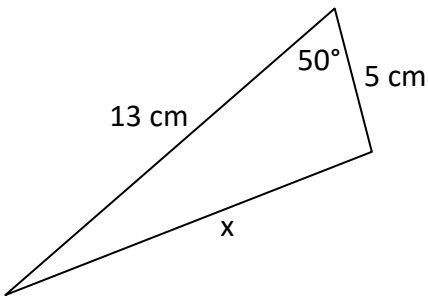
3. In 1966 Stuart Ash designed the logo shown below for the Canadian Centennial celebrations in 1967. The logo is comprised of 11 equilateral triangles to form a shape similar to a maple leaf.



If the base triangles have a width of 60 cm, sketch ONE of the triangles below and state all side and angle measurements. (Ignore the 'gaps' in the image.)



4. Find the length of the side labelled 'x' in the following triangle:



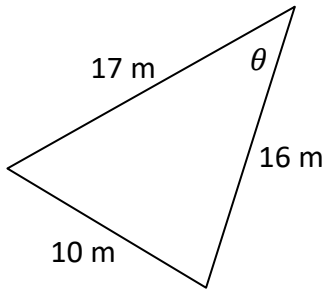
$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$a^2 = 13^2 + 5^2 - 2(13)(5) \cos 50^\circ$$

$$a^2 = 110.4376107$$

$$a = 10.51 \text{ cm}$$

5. Solve for the indicated angle (θ) in the triangle shown below.



$$\cos \theta = \frac{b^2 + c^2 - a^2}{2bc}$$

$$\cos \theta = \frac{16^2 + 17^2 - 10^2}{2(16)(17)}$$

$$\cos \theta = \frac{445}{544}$$

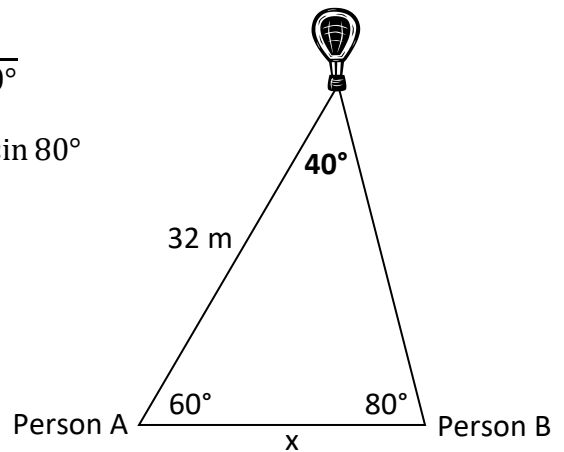
$$\theta = 35.11^\circ$$

6. Two people are holding anchor ropes that are attached to a weather balloon. Person A can see the balloon at an angle of elevation of 60° . Person B can see the balloon at an angle of elevation of 80° . If the rope that person A is holding is 32 m long, how far apart are person A and person B?

$$\frac{32}{\sin 80^\circ} = \frac{x}{\sin 40^\circ}$$

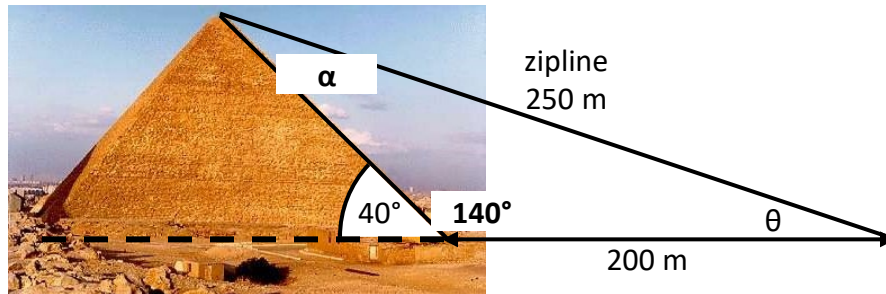
$$x = 32 \times \sin 40^\circ \div \sin 80^\circ$$

$$x = 20.89 \text{ m}$$



7. Biljana wants to open an exciting attraction in Egypt: She wants to install a zipline from the tip of the Great Pyramid of Giza to the ground. The angle between the side of the pyramid and the ground is 40° . She wishes to run the zipline from the tip to a point on the ground that is 200 m from the base of the pyramid. She knows that the length of the zipline will be 250 m. She is only allowed to run the attraction if the angle the zipline makes with the ground (labelled θ) is less than 10° .

Will she be allowed to run her attraction? Justify your answer.



$$\frac{250}{\sin 140^\circ} = \frac{200}{\sin \alpha}$$
$$\sin \alpha = 200 \times \sin 140^\circ \div 250$$
$$\sin \alpha = 0.5142300877$$
$$\alpha = 30.95^\circ$$

$$\theta = 180^\circ - 140^\circ - 30.95^\circ$$

$$\theta = 9.05^\circ$$