

Watch the video: <https://youtu.be/AXjZdhocSG8>. Answer the questions below.

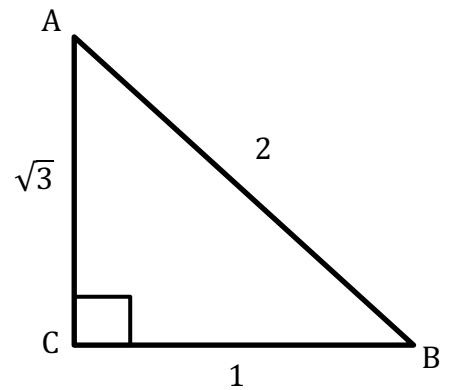
1) Give a definition in your own words:

a) Opposite:

b) Adjacent:

c) Hypotenuse:

2) Refer to the diagram to the right and answer the questions.



a) What is the measure of the side opposite $\angle B$? _____

b) What is the measure of the side adjacent to $\angle A$? _____

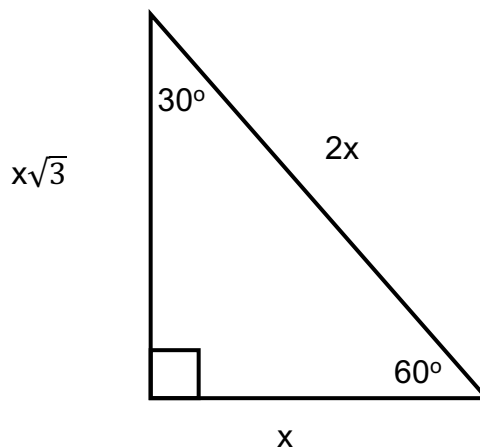
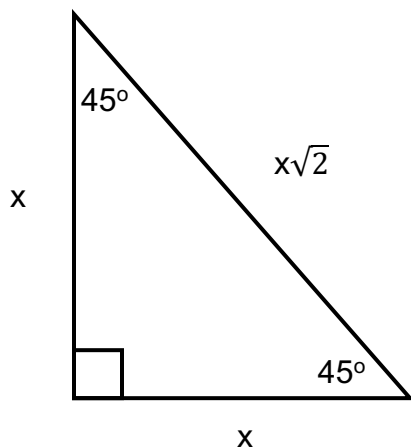
3) In the term SOHCAHTOA, S = sine (sin for short), C = cosine (cos for short), and T = tangent (tan for short). Fill in the blank as best as you can.

a) $\sin = \frac{O}{H}$ _____

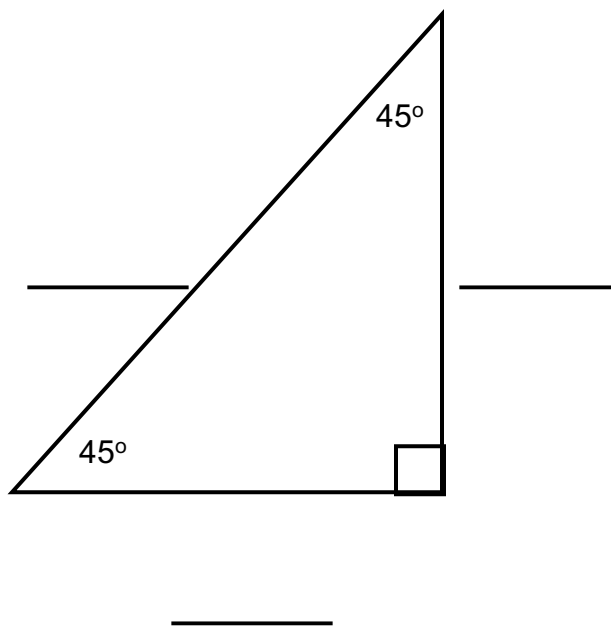
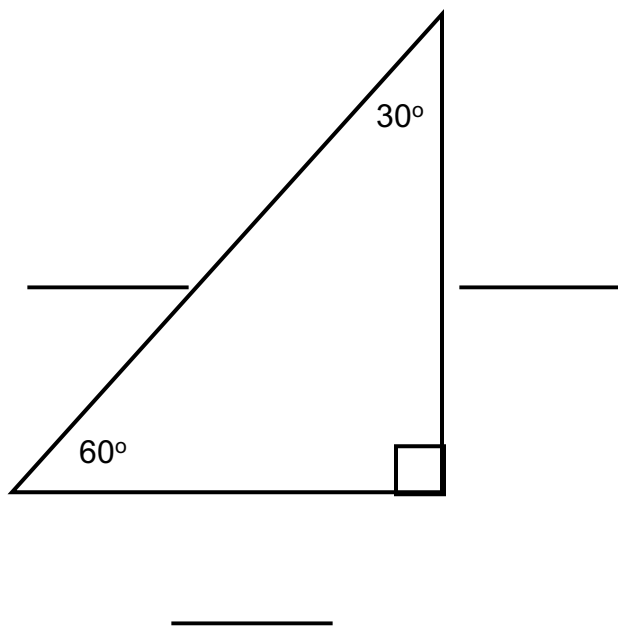
b) $\cos = \frac{A}{H}$ _____

c) $\tan = \frac{O}{A}$ _____

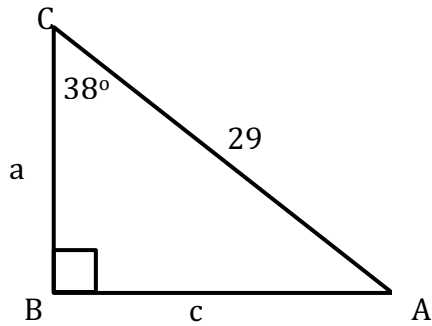
- 1) Watch this video <https://youtu.be/rvio7JszzAQ> on special right triangles.
- 2) If $x = 1$, what are the measures of the sides of these triangles?



- 3) Using **different** values not seen in the video or the worksheet, fill out the sides of these triangles according to the 45-45-90 or 30-60-90 rules.



1) Watch this video: <https://www.youtube.com/watch?v=LdwIDwjrcgY>



Refer to the diagram for $\triangle ABC$, above. Round to the nearest thousandth where necessary.

2) What does SOHCAHTOA stand for?

3) Which side is opposite angle C?

4) Which side is adjacent to angle C?

5) Solve for c using the sin function.

6) Solve for a using the cosine function.

7) Solve for angle A using tangent function.

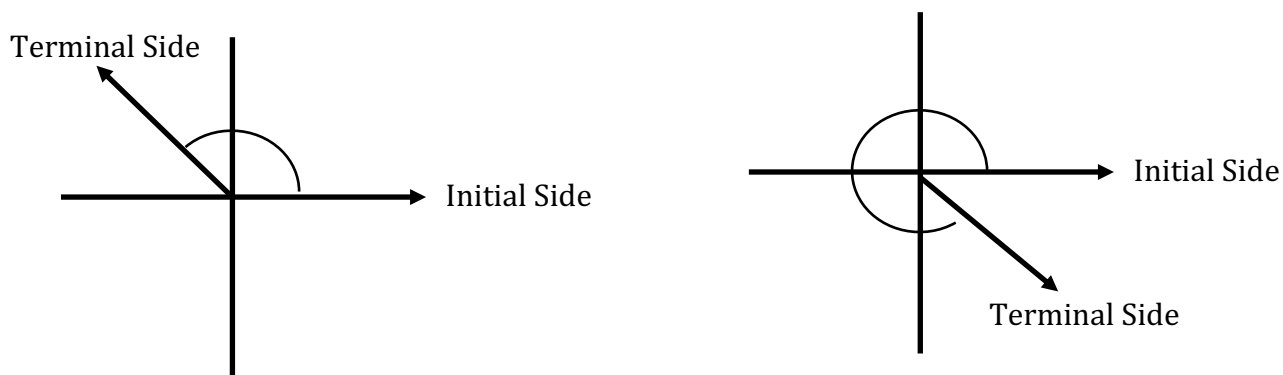
8) Can you solve for angle A without using a trigonometric function? If yes, how?

Watch this video on coterminal angles and reference angles:
https://youtu.be/JtAxPZxJfU4?si=R_hxpaOEM3FepttR

Initial Side: A straight line that indicates the beginning of an angle. This is always located on the positive portion of the x-axis.

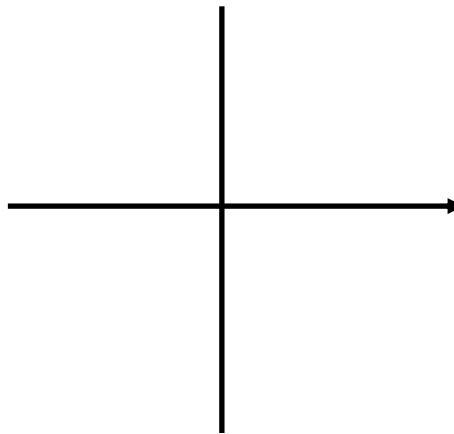
Terminal Side: A straight line that has been rotated and indicates the end of an angle. This can end up in one of the quadrants of the xy-axis.

Examples:



Use this website to assist you with this project: <https://www.mathopenref.com/reference-angle.html>

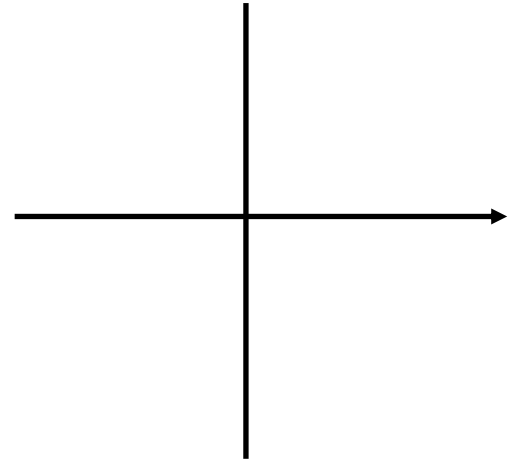
- 1) Follow the directions. The initial side of the angle is drawn for you already.
 - a. On the axis to the right, draw a 60° angle starting from the positive x-axis.



- b. What is the measure of the acute angle (between 0 and 90°) between the terminal side and the x-axis?
 - c. Refer to the diagram on page 3. Which quadrant is the terminal side of the angle in?

2) Follow the directions. The initial side of the angle is drawn for you already.

- a. On the axis to the right, draw a 150° angle starting from the positive x-axis.

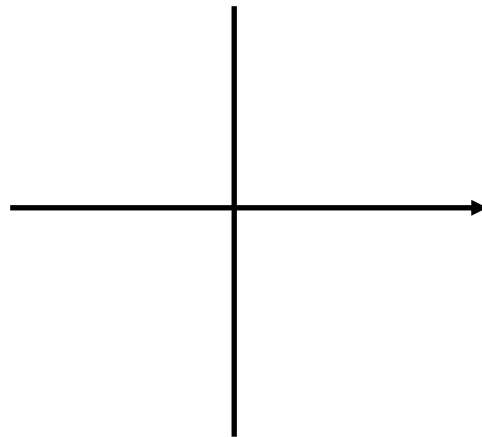


- b. What is the measure of the acute angle (between 0 and 90°) between the terminal side and the x-axis?

- c. Refer to the diagram on page 3. Which quadrant is the terminal side of the angle in?

3) Follow the directions. The initial side of the angle is drawn for you already.

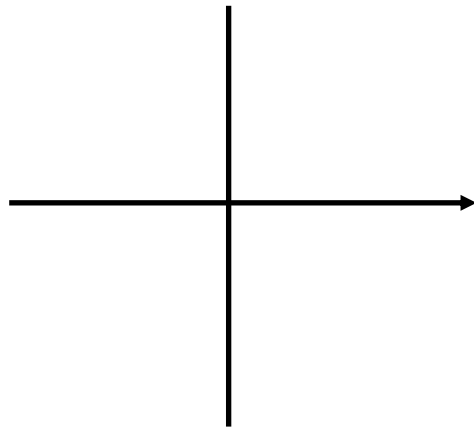
- a. On the axis to the right, draw a 225° angle starting from the positive x-axis.



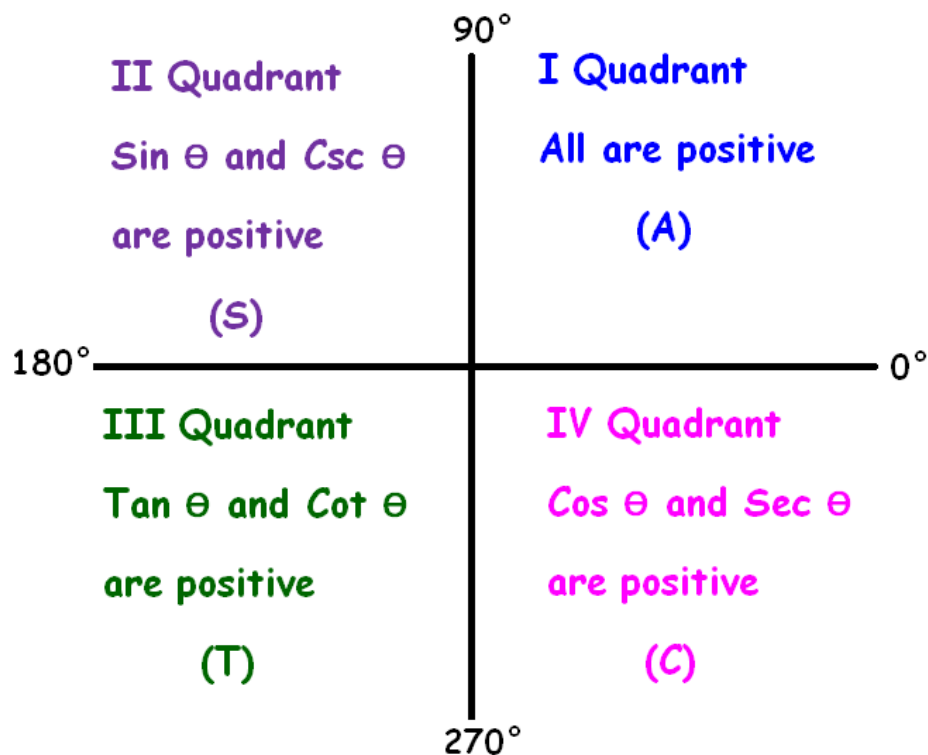
- b. What is the measure of the acute angle (between 0 and 90°) between the terminal side and the x-axis?

- c. Refer to the diagram on page 3. Which quadrant is the terminal side of the angle in?

- 4) Follow the directions. The initial side of the angle is drawn for you already.
- On the axis to the right, draw a 300° angle starting from the positive x-axis.



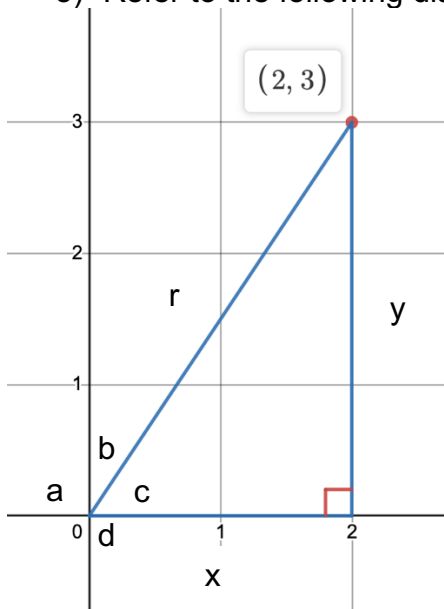
- What is the measure of the acute angle (between 0 and 90°) between the terminal side and the x-axis?
- Refer to the diagram on page 3. Which quadrant is the terminal side of the angle in?



Watch these 2 videos: https://youtu.be/eYOA6akNjKc?si=TQI0qL_qnieAVH7A
<https://youtu.be/50BLDkLP2Is?si=hkLuptWNRHELN1nq>

- 1) In which quadrants does the sin function produce a negative answer?
- 2) In which quadrants does the cos function produce a negative answer?
- 3) In which quadrants does the tan function produce a negative answer?
- 4) In which quadrants does the csc function produce a positive answer?

5) Refer to the following diagram:



- a) The reference angle is located at: (circle one)
 - a. a
 - b. b
 - c. c
 - d. d
 - e. Ref angle?
- b) What is the length of x?
- c) What is the length of y?
- d) What is the length of r?

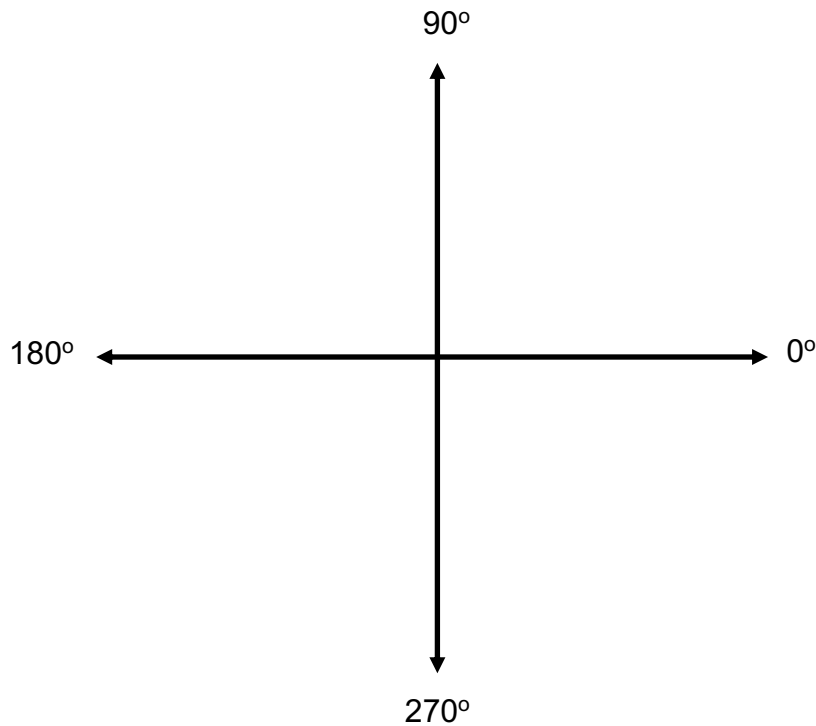
6) If $\cos(\theta) = -\frac{7}{10}$ and $\sin(\theta) > 0$, in which quadrant does θ belong?

1) Watch this video on trigonometry: <https://youtu.be/M12LAD28JV8?si=hz4pRApMiU6rdzhm>

Let's calculate the exact value of $\cos(\theta)$, where $\theta = \frac{7\pi}{6}$. Show all your calculations.

2) Convert $\frac{7\pi}{6}$ radians into degree measure by multiplying $\frac{\pi}{180}$.

- 3) On the axes below, draw the angle you calculated in #2. Put the *initial side* at 0° and the *terminal side* at the calculated degree measure.
- a. In what quadrant does the terminal side lie?



- 4) Identify the measure of *reference angle* of θ by calculating the angle between the *terminal side* and the *x-axis*.

5) Using a vertical line drawn towards the x-axis, make a right triangle, using the *terminal side* and the x-axis as the other two sides. Make sure the *reference angle* is contained within the triangle.

a. What are the measures of the angles of this right triangle? Choose one and label the right triangle accordingly.

i. $30^\circ - 60^\circ - 90^\circ$

ii. $45^\circ - 45^\circ - 90^\circ$

b. Label the *opposite*, *adjacent*, and *hypotenuse* sides of your right triangle.

c. What are the measures of the sides of this right triangle? Choose one and label the right triangle accordingly.

i. $1 - \sqrt{3} - 2$

ii. $1 - 1 - \sqrt{2}$

6) In #3a, you identified which quadrant the *terminal side* is located. Is the *cos* function *positive* or *negative* in this quadrant? Choose one.

i. Positive

ii. Negative

7) According to SOHCAHTOA, what is the ratio for the *cos* function? Choose one.

i. $\frac{opp}{hyp}$

ii. $\frac{adj}{hyp}$

iii. $\frac{opp}{adj}$

8) Use your answers from #7 and #6 to provide the exact value of $\cos\left(\frac{7\pi}{6}\right)$.