

# Pre-Calculus 11 - VLN

## Chapter 6: Trigonometry

### Lesson 7: Special Angles and Triangles

#### Question #1

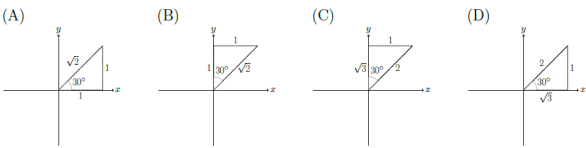
Reference Q.13296  
Complete the following chart.

| $x$      | $0^\circ$ | $30^\circ$ | $45^\circ$ | $60^\circ$ | $90^\circ$ |
|----------|-----------|------------|------------|------------|------------|
| $\sin x$ |           |            |            |            |            |
| $\cos x$ |           |            |            |            |            |
| $\tan x$ |           |            |            |            |            |

#### Question #2

Reference Q.18966

a. Which of the following triangles is a correct representation of the reference angle  $30^\circ$  in quadrant 1?

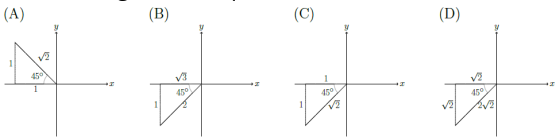


b. Find the Sine, Cosine, and Tangent ratios of  $30^\circ$ .

#### Question #3

Reference Q.18967

a. Which of the following triangles is a correct representation of the reference angle  $45^\circ$  in quadrant 3?



b. What is the actual angle of this construction? (Choose the angle between  $0^\circ$  and  $360^\circ$ .)

c. Find the Sine, Cosine, and Tangent ratios of  $45^\circ$ .

#### Question #4

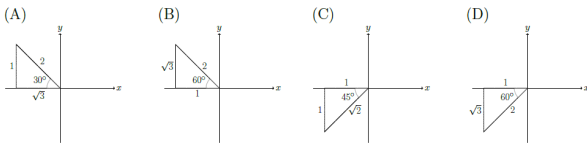
Reference Q.13297  
Find the exact value of the following using the chart and reference angle method.

- a.  $\cos 120^\circ$
- b.  $\tan 300^\circ$
- c.  $\sin 135^\circ$
- d.  $\sin 330^\circ$
- e.  $\cos 315^\circ$
- f.  $\tan 180^\circ$
- g.  $\cos 180^\circ$
- h.  $\sin 180^\circ$
- i.  $\tan 150^\circ$
- j.  $\cos 210^\circ$
- k.  $\tan 270^\circ$
- l.  $\cos 270^\circ$
- m.  $\sin 270^\circ$
- n.  $\tan 240^\circ$
- o.  $\cos^2 225^\circ$

#### Question #5

Reference Q.18968

a. Which of the following triangles is a correct representation of the angle  $510^\circ$ ?

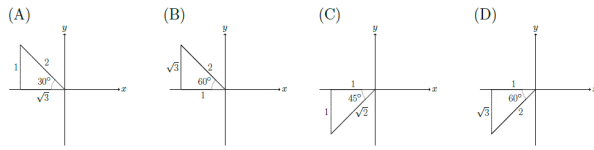


b. Find the Sine, Cosine and Tangent ratios of  $510^\circ$ .

## Question #6

Reference Q.18969

- a. Which of the following triangles is a correct representation of the angle  $-72, 240^\circ$ ?



- b. Find the Sine, Cosine and Tangent ratios of  $-72, 240^\circ$ .

## Question #7

Reference Q.13299

The point  $(-\sqrt{2}, -\sqrt{6})$  is on the terminal arm of an angle  $\theta$ . Without using technology, complete the following questions.

- Draw the angle in standard position and mark the point on the terminal arm.
- State the values of  $x$  and  $y$  and hence the value of  $\tan \theta$ .
- State the reference angle and hence the rotation angle  $\theta$ .

## Question #8

Reference Q.13300

The point  $(5, -5)$  is on the terminal arm of an angle  $A$ . Without using technology, determine the value of angle  $A$ .

## Question #9

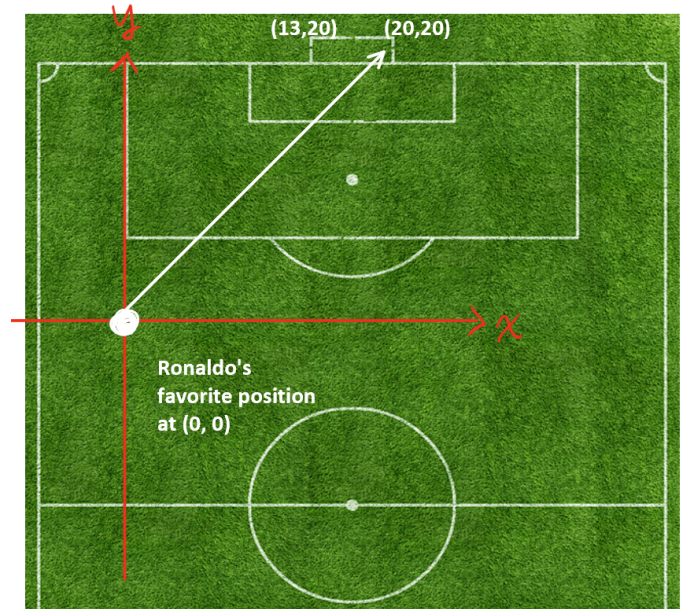
Reference Q.18975

A thief steals someone's vehicle and is driving due south for the border which is 1km away. A police officer in a police car receives an order to catch the thief before he reaches the border and escapes. The thief is currently at 1km east of the officer, so the police officer decides to drive at an angle to cut him off right at the border. Suppose the thief was travelling constantly at 100km/h. What is the minimum average speed the police officer would need to be going to beat the thief to the border?

## Question #10

Reference Q.18976

Christiano Ronaldo is one of the famous soccer players in the world. His favorite freekick position is shown below at  $(0, 0)$ . Assume he is aiming his shot at the top right hand corner of the net, which is located 20m right and 20m above Ronaldo.



- In which quadrant does the terminal arm lie under this setting?
- What is the reference angle?
- If Ronaldo's freekick speed is found to be **107 km/h**, how long did the ball travel until it hit the net? Your answer should be in seconds. (Assume the goalie was not able to save his super freekick.)
- Suppose the length of the net is 7 meters wide. If Ronaldo kicks the ball with the reference angle of  $60^\circ$ , will his shot be on target?