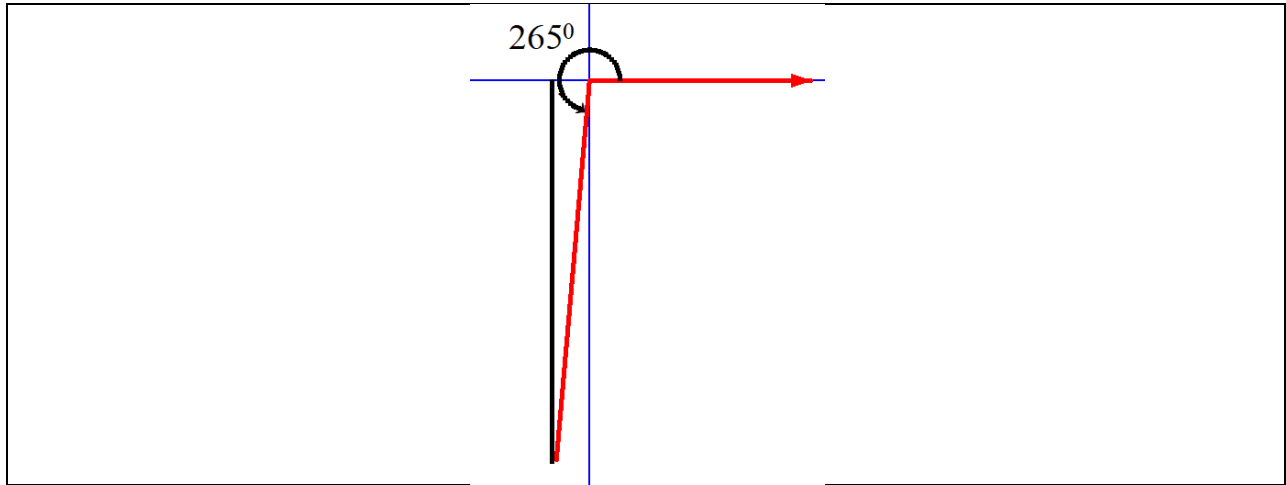# Quadrantal Angle Ratios Practice

Use the diagram below to answer the first question.



$265^0$

1. When the angle reaches $270^0$, the non-existent side is the _____.
2. The side that melds with the hypotenuse at $270^0$ is the _____.
3. The ratio (sin, cos or tan) having a value of zero is _____.
4. What is sin $270^0$? _____
5. The ratio (sin, cos, or tan) that is undefined is _____.

6. As a $353^0$ angle in standard position continues to rotate counter clockwise, until the terminal arm reaches $360^0$, which statement below is true?
   A) The adjacent side will become non-existent.
   B) Two of the three primary trigonometric ratios are zero.
   C) The opposite side melds with the hypotenuse to become the same side at $360^0$.
   D) The tangent ratio is undefined.

7. Which of the following angle measures is **not** quadrantal?

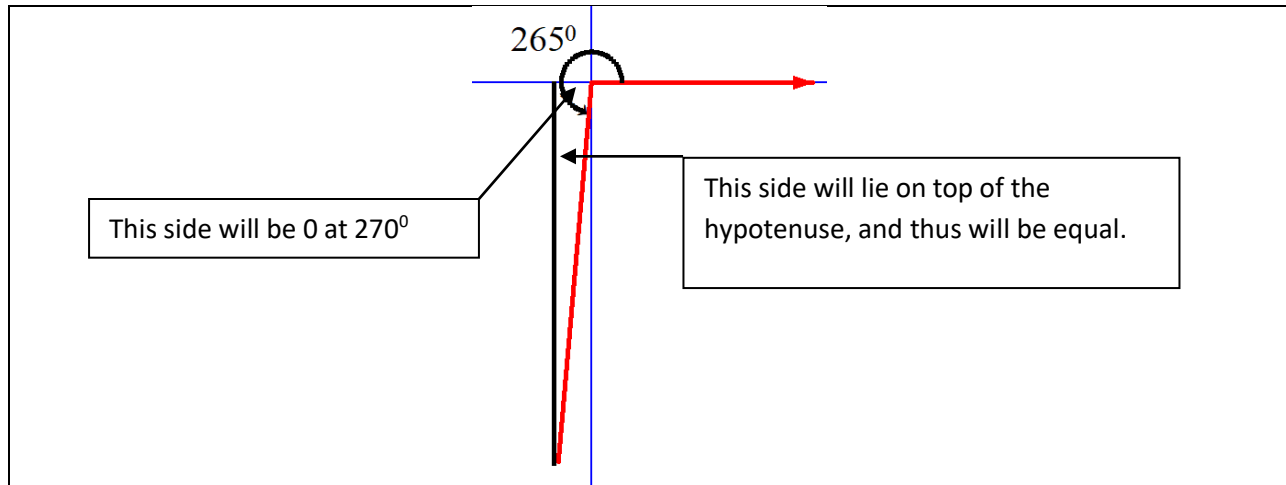   A) $90^0$          B) $250^0$          C) $270^0$          D) $0^0$

8. Which two quadrantal angles have ratios that are negative? Explain.

9. Which angle greater than $180^0$ has a tangent ratio that is undefined? Explain.
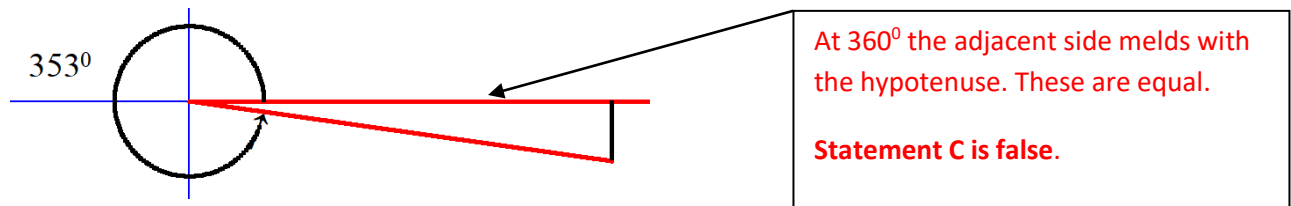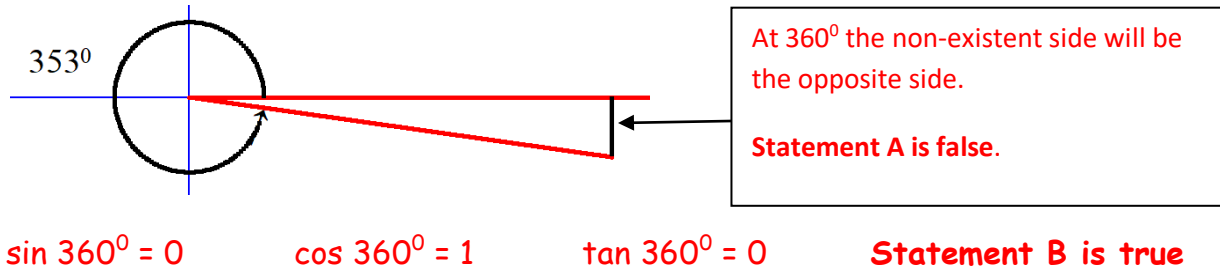
# Quadrantal Angle Ratios Practice Solutions

Use the diagram below to answer the first question.

$265^0$

This side will be 0 at $270^0$

This side will lie on top of the hypotenuse, and thus will be equal.

1. When the angle reaches $270^0$, the non-existent side is the __adjacent__.
2. The side that melds with the hypotenuse at $270^0$ is the _opposite____.
3. The ratio (sin, cos or tan) having a value of zero is _cos__.
4. What is sin $270^0$? _-1_ [The sides are equal and they are negative because the y values below the x-axis are negative]
5. The ratio (sin, cos, or tan) that is undefined is _tan__. [The definition of tangent is opposite/adjacent. Since the adjacent side is 0, division by 0 is undefined]

6. As a $353^0$ angle in standard position continues to rotate counter clockwise, until the terminal arm reaches $360^0$, which statement below is true?
   A) The adjacent side will become non-existent. False
   B) Two of the three primary trigonometric ratios are zero. True
   C) The opposite side melds with the hypotenuse to become the same side at $360^0$. False
   D) The tangent ratio is undefined. False

Solution

353⁰

At 360⁰ the non-existent side will be the opposite side.

**Statement A is false**.

$\sin 360^0 = 0$        $\cos 360^0 = 1$        $\tan 360^0 = 0$        **Statement B is true**

353⁰

At 360⁰ the adjacent side melds with the hypotenuse. These are equal.

**Statement C is false**.

The tangent ratio is 0. **Statement D is false**.

The correct answer is B.

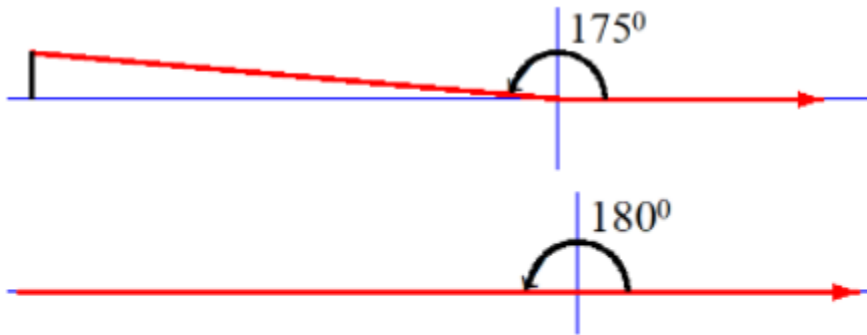7. Which of the following angle measures is **not** quadrantal?
   A) $90^0$                    B) $250^0$                    C) $270^0$                    D) $0^0$

The correct answer is B.

8. Which two quadrantal angles have ratios that are negative? Explain.

The opposite side will be zero. Since sine is opposite/hypotenuse, **sin 180⁰ = 0**. The hypotenuse will lie on top of the adjacent side, and thus be of equal length. Since the adjacent side is negative, **cos 180⁰ = -1**.

One answer is cos 180⁰, which is equal to -1 (as shown above).

The other answer is sin 270⁰, which is also equal to -1.

9. Which angle greater than 180⁰ has a tangent ratio that is undefined? Explain.

Solution
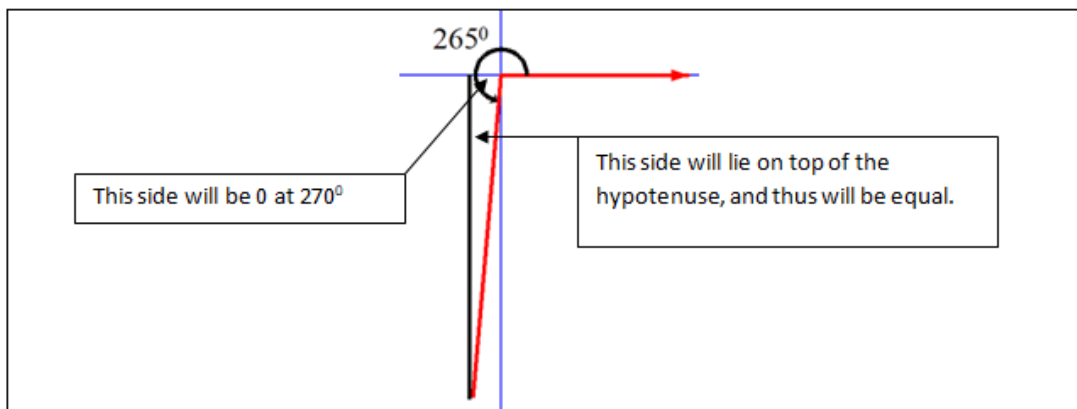
Tan $270^0$ is undefined. As shown in the diagram above, the side adjacent the reference angle will become zero at $270^0$. Since tangent is defined as

$\frac{opposite}{adjacent}$ , and division by zero is undefined, tan $270^0$ is undefined.