Lecture 26: Introduction to trignonometry

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Question 1.

Select the best name for The 90.

A The $\pi/2$.

B $89++$

C The right angle

D 1011010, base 2.

E $91--$

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B $89 + +$

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Please change your calculators to radian mode and leave it in radian mode for all of your mathematics courses. On a TI-84, press $\boxed{\texttt{MODE}}$ and make sure that `Radians` is highlighted on the third line. If it is not move to the word `Radians` with the arrow key $\boxed{\vee}$ and press $\boxed{\texttt{ENTER}}$.

Question 2.

Suppose that we draw an angle in standard position and of measure $-9\pi/2$ radians. Where does the terminal side meet the unit circle?

A $(1, 0)$

B $(0, 1)$

C $(-1, 0)$

D $(0, -1)$

E The terminal side does not cross the unit circle.

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We write $-9\pi/2 = -2\pi + -\pi/2$ and recognize that the resulting terminal side is the same if we neglect the full revolution. The angle $\pi/2$ is one quarter of a full revolution and we move in the negative or clockwise direction, we will and meet the unit circle at the point $(0,-1)$.

Question 3.

Convert the angle measures to radians.

$$A = 180^\circ \text{ and } B = 45^\circ$$

A $11/14$ and $B = 22/7$

B $A = 22/7$ and $B = 11/14$

C $A = \pi/2$ and $B = \pi/8$

D $A = \pi/4$ and $B = \pi$

E $A = \pi$ and $B = \pi/4$

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We know a full turn is 360° or 2π radians. Thus a half turn is 180° or π radians. The angle 45° is half of right angle or $\frac{1}{2} \cdot \frac{\pi}{2} = \pi/4$.

Question 4.

Suppose we have a $\pi/4 - \pi/4 - \pi/2$ triangle with hypotenuse of length 2. What is the common length of the two legs?

A 1

B 2

C $\sqrt{2}$

D $1/\sqrt{2}$

E $1/2$

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If x is the length of the legs, then the theorem of Pythagoras tells us that $x^2 + x^2 = 2^2$. Solving gives $x = \sqrt{2}$.
Alternately, we may use similar triangles and multiply each side of the triangle with sides $\sqrt{2}/2, \sqrt{2}/2, 1$ by 2 to obtain the sides are $\sqrt{2}, \sqrt{2}, 2$

Question 5.

Suppose an angle of measure $5\pi/4$ is drawn in standard position. Where does the terminal side cross the unit circle?

A $(-\sqrt{2}/2, \sqrt{2}/2)$

B $(-\sqrt{2}/2, -\sqrt{2}/2)$

C $(\sqrt{2}/2, -\sqrt{2}/2)$

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E $(0, 1)$, I needed a fifth option, but this one is probably wrong.

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