Complete the unit circle below.
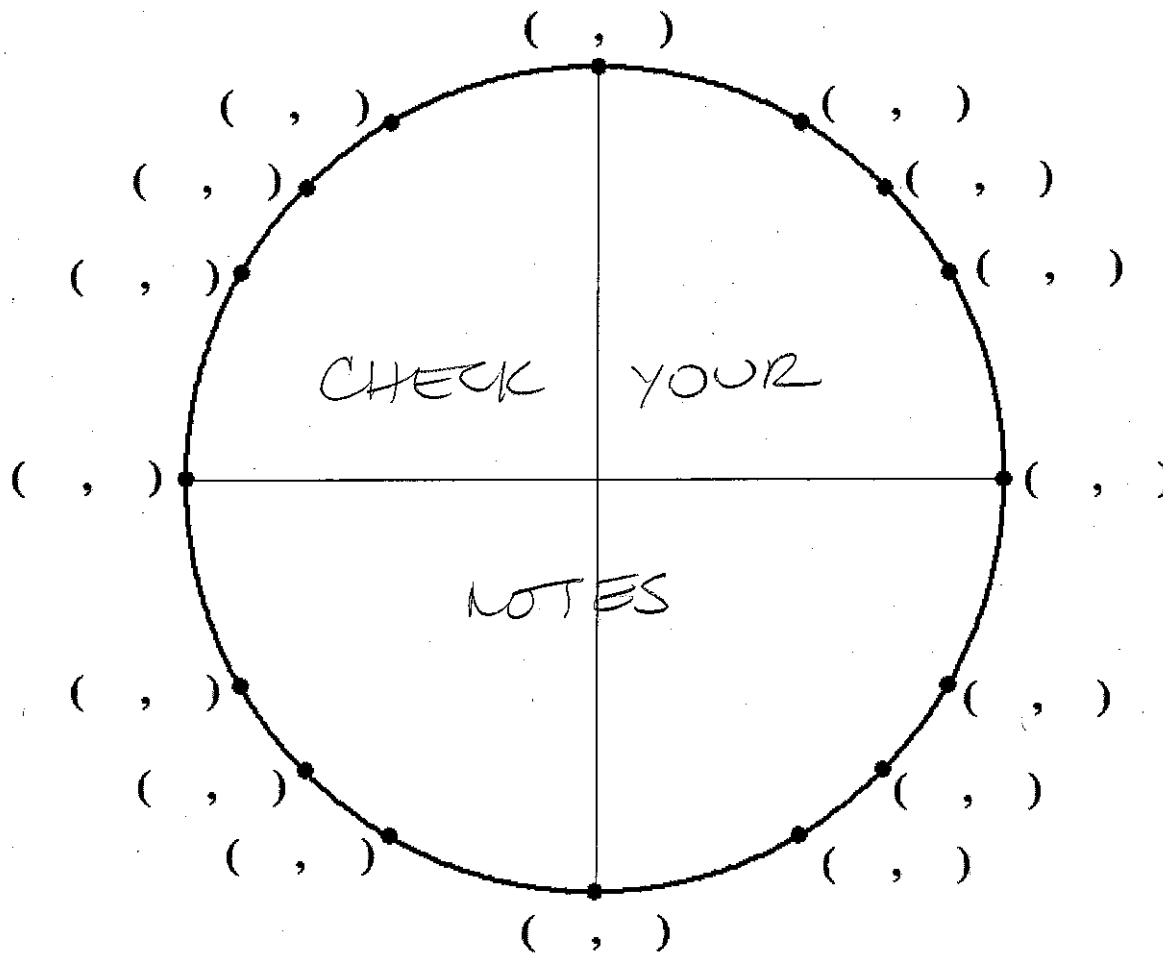
Inside the circle, label the radian measure of each point.

Outside the circle, label the corresponding $x-$ and $y-$ coordinates of each point.

(,)
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CHECK YOUR

NOTES

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Use the unit circle above to fill in the blanks below. Simplify all answers (including rationalizing denominators). Write "UNDEFINED" if the expression has no value.

[a] $\csc\dfrac{7\pi}{4} = \underline{\quad -\sqrt{2} \quad}$ $\dfrac{1}{-\frac{\sqrt{2}}{2}} = -\dfrac{2}{\sqrt{2}} \cdot \dfrac{\sqrt{2}}{\sqrt{2}}$ [b] $\tan\dfrac{2\pi}{3} = \underline{\quad -\sqrt{3} \quad}$ $\dfrac{\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = \dfrac{\sqrt{3}}{2} \cdot \dfrac{-2}{1} = -\sqrt{3}$

$= -\dfrac{2\sqrt{2}}{2} = -\sqrt{2}$

[c] $\cot\dfrac{7\pi}{6} = \underline{\quad \sqrt{3} \quad}$ $\dfrac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = \sqrt{3}$ [d] $\sec\dfrac{3\pi}{2} = \underline{\text{UNDEFINED}}$ $\dfrac{1}{0}$

Fill in the blanks below. Simplify all answers (including rationalizing denominators). **SCORE:** _____ / 5 PTS
Write "UNDEFINED" if the expression has no value.

[a] $-\dfrac{10\pi}{3}$ is co-terminal with __$\dfrac{2\pi}{3}$__ (**NOTE**: Your answer must be between 0 and 2π)

[handwritten] $-3\frac{1}{3}\pi$ COTERMINAL WITH $-1\frac{1}{3}\pi + 2\pi = \dfrac{2\pi}{3}$

[b] $\sin\left(-\dfrac{10\pi}{3}\right) =$ __$\dfrac{\sqrt{3}}{2}$__ *[handwritten]* $\sin\dfrac{2\pi}{3} = \dfrac{\sqrt{3}}{2}$

[c] The supplement of $\dfrac{2\pi}{7}$ radians is __$\dfrac{5\pi}{7}$__

[handwritten] $\pi - \dfrac{5\pi}{7} = \dfrac{7\pi - 5\pi}{7} = \dfrac{2\pi}{7}$

[d] 99 degrees = __$\dfrac{11\pi}{20}$__ radians

[handwritten] $\overset{11}{\cancel{99}} \times \dfrac{\pi}{\cancel{180}\,20}$

[e] $\dfrac{9\pi}{20}$ radians = __81__ degrees

[handwritten] $\dfrac{9\cancel{\pi}}{\cancel{20}} \times \dfrac{\overset{9}{\cancel{180}}}{\cancel{\pi}}$

Suppose $\sin t = -\frac{5}{13}$ and $\cos t = \frac{12}{13}$. Fill in the blanks below. Simplify all answers. **SCORE:** _____ / 2 PTS

[a] $\sec t =$ __$\dfrac{13}{12}$__ *[handwritten]* $\dfrac{1}{\cos t} = \dfrac{13}{12}$

[b] $\cos(-t) =$ __$\dfrac{12}{13}$__ *[handwritten]* $\cos t = \dfrac{12}{13}$

In the diagram of a central angle on the right,   **SCORE:** _____ / **5 PTS**
the radius of the circle is 18 mm and the intercepted arc has length 12 mm. (NOTE: The diagram is **NOT** drawn to scale.)

[a] The central angle is ___$\frac{2}{3}$___ radians. $S = r\theta \rightarrow \theta = \frac{S}{r} = \frac{12}{18} = \frac{2}{3}$

[b] The area of the intercepted sector is ___$108\ mm^2$___. $A = \frac{1}{2}r^2\theta = \frac{1}{2}(18)^2 \frac{2}{3} = 108$

[c] If an object is moving around the circle at a linear speed of 60 mm/s, $V = r\omega \rightarrow \omega = \frac{V}{r} = \frac{60}{18} \cdot \frac{10}{3}$

   its angular speed is ___$\frac{10}{3}$___ ___RADIANS/s___.
                                                    (specify the units)