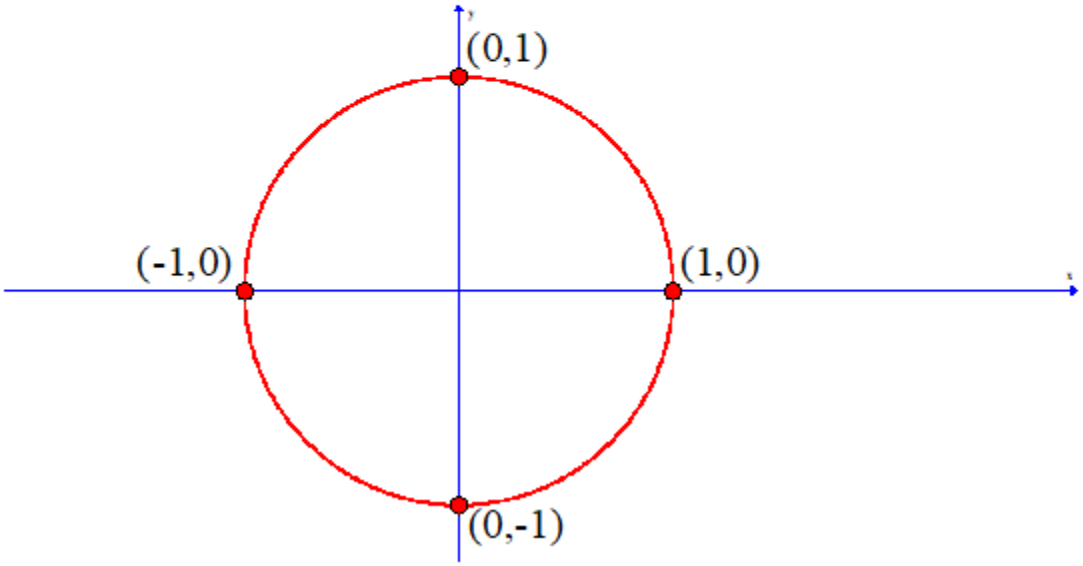
Trigonometric Ratios

Use the following information to answer the first question.

When working with exact trigonometric ratios of 1, -1, or 0, noting the coordinates on the axes of the unit circle, can be useful. Recalling that for any point on the unit circle, P(θ) = (cos θ, sin θ) and $\tan\theta = \frac{\sin\theta}{\cos\theta}$, answer the following questions without a calculator.



1. What is
   a) sin 270^0
   b) cos 90^0
   c) tan 360^0
   d) sin $-\pi$
   e) cos $\left(-\frac{\pi}{2}\right)$
   f) tan 3π
   g) sec 180^0
   h) csc $\left(\frac{3\pi}{2}\right)$
   i) cot 450^0

2. On a unit circle, Point P$\left(\frac{8}{17},-\frac{15}{17}\right)$ lies on the terminal arm of an angle in standard position. What is the exact value of cscθ?

   a) $\frac{15}{8}$ b) $\frac{17}{15}$ c) $-\frac{17}{15}$ d) $-\frac{17}{8}$

3. The terminal arm of θ, when drawn in standard position, contains point M(x,y), where M is on the unit circle. If cos θ = $-\frac{6}{11}$, and tan θ < 0, what is the value of y?

   a) $\frac{\sqrt{85}}{11}$ b) $-\frac{\sqrt{85}}{11}$ c) $\frac{85}{6}$ d) $-\frac{85}{6}$

4. The point D(5,-12) lies on the terminal arm of an angle θ in standard position. What is the exact value of sec θ? Show a diagram.

5. Determine the measures of all angles that satisfy each of the following and use diagrams.
   a) cos θ = 0.843 in the domain $-360^0 < \theta < 180^0$. Give approximate answers to the nearest tenth.

b) csc θ = $-\frac{2}{\sqrt{2}}$ in the domain $-2\pi \leq \theta \leq \pi$. Give exact answers.

6. Determine the exact values for each of the following:

   a) tan $\left(\frac{\pi}{2}\right)$

   b) tan(-300^0) + csc $\left(\frac{7\pi}{6}\right)$

   c) sin$\left(\frac{3\pi}{4}\right)$ - tan^2 (-45^0)

Use the following information to answer the next question.

Points A$\left(\frac{\sqrt{3}}{2},-\frac{1}{2}\right)$ and B$\left(\frac{\sqrt{2}}{2},-\frac{\sqrt{2}}{2}\right)$ are 2 points on the unit circle. The Point O(0,0) is the centre of the unit circle.

7. The measure of the largest angle, AOB, in degrees, is _____.

8. The Point K($\frac{1}{2}$, y) is on the terminal arm of angle θ drawn in standard position on the unit circle. An angle that could be co-terminal with θ is

   a) 300^0 b) 135^0 c) 120^0 d) 30^0

9. If sec θ = $-\frac{2}{\sqrt{3}}$, where $0 \leq \theta < 2\pi$, then θ lies in quadrants __i__ and tan θ is equal to __ii___.
   The statement above is completed by the information in row

Row	i	ii
A	1 and 2	$\pm\frac{1}{\sqrt{3}}$
B	1 and 4	$\pm\sqrt{3}$
C	2 and 4	$\pm\sqrt{3}$
D	2 and 3	$\pm\frac{1}{\sqrt{3}}$

10. Given cos θ = $\frac{\sqrt{13}}{7}$, where $\frac{3\pi}{2} \leq \theta \leq 2\pi$, determine the exact value of cot θ.

11. If tan θ = $\frac{4}{3}$, where $0 \leq \theta < 2\pi$, then the largest possible value of θ, to the nearest tenth, is _____ radians.