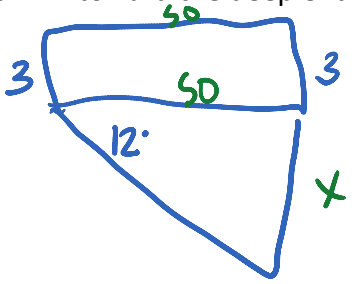
Name: Key!

Ch. 6 Review

Topics that will be covered on the test:

- Evaluating Trigonometric Ratios
- Degrees, Minutes, and Seconds (1 question)
- Word Problems dealing with Trig Applications: Section 6.2
- Converting between radian and degree measures (procedural)
- Arc Length: know both the formulas and when to use them.
- Angular and Linear Speed (1 question)
- Special Right Triangles
- 6.4 Evaluating Trig Functions: Find exact values!!!!
- Reference Angles/ Coterminal Angles
- **Trigonometric Identities!**
  - Know the Pythagorean identities.
  - Negative identities.

1. A swimming pool is 3 feet deep in the shallow end. The bottom of the pool has a steady downward drop of 12° toward the deep end. If the pool is 50 feet long, how deep is the deep end?



$\tan 12 = \frac{x}{50}$

$50 \tan 12 = x$

$x = 10.6$

$10.6 + 3 \approx \boxed{13.6 \text{ ft}}$

2. Find the radian measure of an angle θ if the diameter of the circle is 98cm and the arc length is 200cm.

$l = 200\text{cm}$ $\quad r = \frac{98}{2}$ $\quad r = 49\text{cm}$

$200 = 49\theta$

$\theta = \frac{200}{49}$ radians

$\theta \approx 4.08$ radians.

3. Write 121.135° into DMS form.

$121^\circ + .135\left(\frac{60}{60}\right)$

$121^\circ + \frac{2.1}{60}$

$121^\circ + 2' + .1\left(\frac{60}{60}\right)$

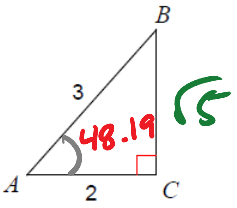
$121^\circ + 2' + \frac{6}{60}''$ → $121^\circ 2' 6''$

a.) Write 25°15′30″ into decimal form.

$25^\circ + \frac{15}{60} + \frac{30}{3600}$

$25 + .25 + \frac{1}{120} = 25.258^\circ$

4. Solve the right triangle.



$\sqrt{5}$

$(\overline{BC})^2 + 2^2 = 3^2$

$(\overline{BC})^2 = 9 - 4$

$(\overline{BC})^2 = 5$

$\overline{BC} = \sqrt{5}$

$\angle A$: $\cos A = \frac{2}{3}$

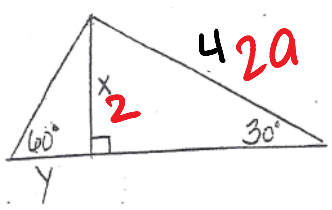
$A = \cos^{-1}\left(\frac{2}{3}\right)$

$A \approx 48.19^\circ$

$90 + 48.19 = 138.19$

$180 - 138.19 = 41.81^\circ$

5. Using only knowledge of special right triangles, find the values for x and y.



$2a = 4$ $x = 2$

$a = 2$

$\frac{a\sqrt{3}}{\sqrt{3}} = \frac{2}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}}a = \frac{2\sqrt{3}}{3}$

6. Convert 325° into radians.

$325 \cdot \frac{\pi}{180} = \frac{65\pi}{36}$

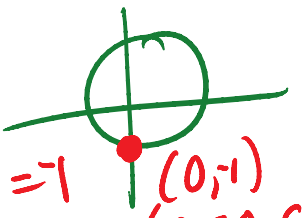
a.) Convert $\frac{3\pi}{5}$ into degrees.

$\frac{3\pi}{5} \cdot \frac{180}{\pi} = \frac{540}{5} = 108°$

7. Find the exact value of $sin\left(-\frac{3\pi}{2}\right)$.

neg. Ident:

$\sin\left(\frac{3\pi}{2}\right) = -1$



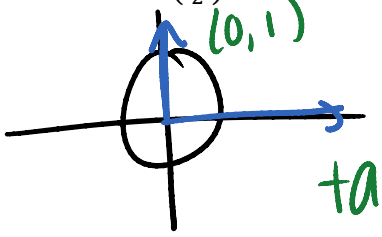
OR!

$\sin\left(-\frac{3\pi}{2}\right) = -\sin\left(\frac{3\pi}{2}\right) = -(-1) = 1$

$-\frac{3\pi}{2} + \frac{4\pi}{2} = \frac{\pi}{2}$

$\sin\left(\frac{\pi}{2}\right) = 1$ Coterminal ∠

a.) $tan\left(\frac{9\pi}{2}\right)$

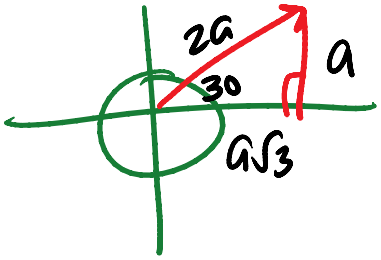


$\frac{9\pi}{2} \cdot \frac{180}{\pi} = 810°$ Coterminal!

$810 - 360 = 450 - 360 = 90°$

$\tan\frac{\pi}{2} = \frac{1}{0} =$ Undefined

8. Write the expression as a single number: $sin\left(\frac{\pi}{6}\right)cos\left(\frac{\pi}{2}\right) - cos\left(\frac{\pi}{6}\right)sin\left(\frac{\pi}{2}\right)$



$\sin\left(\frac{\pi}{6}\right) = \frac{a}{2a} = \frac{1}{2}$

$\cos\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}$

$\sin\left(\frac{\pi}{2}\right) = 1$

$\cos\left(\frac{\pi}{2}\right) = 0$

$\frac{1}{2}(0) - \frac{\sqrt{3}}{2}(1) = \frac{-\sqrt{3}}{2}$

9. Simplify. $\frac{tan^2x}{tan^2x+1}$

$\frac{\frac{\sin^2x}{\cos^2x}}{\sec^2x} \rightarrow \frac{\frac{\sin^2x}{\cos^2x}}{\frac{1}{\cos^2x}}$

10. Simplify. $\frac{\cos x}{1-sinx} - \tan x$

$\frac{\cos x}{1-\sin x} - \frac{\sin x}{\cos x}$ (cosx) (1-sinx)

$\frac{\cos^2 x - \sin x + \sin^2 x}{\cos x(1-\sin x)}$

$\frac{\sin^2 x}{\cos^2 x} \cdot \frac{\cos^2 x}{1}$

$= \sin^2 x$

$\frac{(1-\sin x)}{\cos x(1-\sin x)}$

$\frac{1}{\cos x} = \sec x$

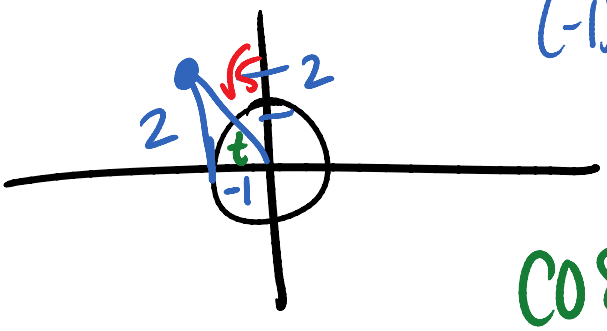
11. Simplify. $sin^4 x - cos^4 x$

$(\sin^2 x - \cos^2 x)(\sin^2 x + \cos^2 x)$

$(\sin^2 x - \cos^2 x)^1$

12. The terminal side of an angle of t radians lies in quadrant II on a line through the origin parallel to $2y + x = 6$. Find the cos t.

$\frac{2y}{2} = \frac{6-x}{2}$ $\quad y = 3 - \frac{1}{2}x$



$(-1)^2 + 2^2 = h^2$

$1 + 4 = h^2$

$h = \sqrt{5}$

$\cos t = \frac{A}{H} = \frac{-1}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}}$

$\frac{-\sqrt{5}}{5}$