Honors Algebra II Trigonometry Review
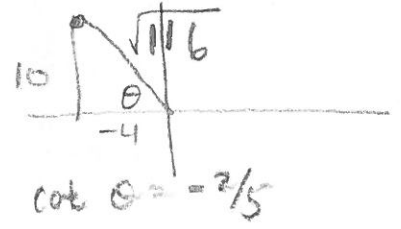
1. The point (-4, 10) is on the terminal side of an angle in standard position. Determine 6 trigonometric functions of that angle.

   $\sin \theta = \dfrac{10}{\sqrt{116}}$ $\cos \theta = \dfrac{-4}{\sqrt{116}}$ $\tan \theta = \dfrac{-5}{2}$

   $\csc \theta = \dfrac{\sqrt{116}}{10}$

   $\sec \theta = \dfrac{\sqrt{116}}{-4}$ $\cot \theta = -\frac{2}{5}$

2. If $\sin \theta < 0$ and $\cos \theta > 0$, which quadrant does θ lie?

   $\underline{IV}$

3. If $\tan \theta < 0$ and $\sin \theta > 0$, which quadrant does θ lie?

   $\underline{II}$

4. Evaluate and leave as an exact value
   a. $\sin 225° = -\sqrt{2}/2$
   b. $\cos 120° = -1/2$
   c. $\tan 90° = 0$
   d. $\cos \dfrac{\pi}{3} = \dfrac{1}{2}$

   e. $\cot\left(-\dfrac{\pi}{3}\right) = \dfrac{-\sqrt{3}}{3}$
   f. $\cos \dfrac{5\pi}{6} = -\sqrt{3}/2$
   g. $\tan \dfrac{3\pi}{4} = -\sqrt{2}/2$

5. Find the reference angle if θ is
   a. $620° = 80°$
   b. $200° = 20°$

   c. $-135° = 45°$
   d. $\dfrac{9\pi}{4}$ $\dfrac{\pi}{4}$

6. Name a positive and negative angle coterminal with
   a. $\dfrac{5\pi}{3}$ $11\pi/3$, $-\pi/3$
   b. $300°$ $660°, -60°$

7. Find the solutions to the equations where $0° \le \theta < 360°$:
   a. $\cos \theta = 0$ $\pi/2, 3\pi/2$
   b. $\tan \theta = -\sqrt{3}$ $120°, 300°$

   c. $\sec \theta = 2$ $60°, 120°$
   d. $\sin \theta = \dfrac{\sqrt{2}}{2} = 45°, 135°$

8. Find the value of $\sin \theta$, if:
   a. $\csc \theta = \dfrac{5}{4}$ where θ lies in QII $\sin \theta = 4/5$
   b. $\cos \theta = -\dfrac{3}{8}$ where θ lies in QII $\sin \theta =$
   c. $\tan \theta = 1$ where θ lies in QI $\sin \theta = \dfrac{\sqrt{2}}{2}$

9. Convert θ into radians:
   a. $\theta = 400° = \dfrac{20\pi}{9}$
   b. $\theta = 120°$ $\dfrac{2\pi}{3}$

   $400 \cdot \dfrac{\pi}{180} = \dfrac{40\pi}{18} = \dfrac{20}{9}$

10. Convert θ into degrees:

   a. $\theta = \dfrac{8\pi}{3} \cdot \dfrac{180}{\pi} = 480°$

   b. $\theta = \dfrac{11\pi}{6} \cdot \dfrac{180}{\pi} = 330°$

   c. $\theta = \dfrac{9\pi}{2} \cdot \dfrac{180}{\pi} = 810°$

11. If a bicycle tire with a radius of 12 inches completes 10 rotations in 15 seconds: **Remember $s = r \cdot \theta$**

   $\dfrac{20\pi}{15}$

   a. What is the angular speed (θ/min)? $\dfrac{20\pi}{15}$

   b. What is the linear speed (s/min)?

12. If $\theta = 300°$ and $r = 4$, what is the arc length? $300 \cdot \dfrac{\pi}{180} = \dfrac{15\pi}{9} \cdot 4 = \boxed{\dfrac{20}{3}\pi}$

13. Graph the following functions: Check on desmos.

   a. $f(x) = 3\sin(2x) - 1$ $P = 2\pi/2 = \pi$

   b. $g(x) = -\dfrac{1}{2}\sin(\pi x) + 3$ $P = 2$

   c. $h(x) = 5\cos\left(\dfrac{\pi x}{3}\right)$ $P = \dfrac{2\pi}{\frac{\pi}{3}} = 6$

   d. $j(x) = -\cos(x) + \dfrac{\pi}{3}$ $P = 2\pi$