Precalculus Acc '19-'20   Name ___Solution Key___
Trig Basics Test

1. $(5, -12)$ is on the terminal side of A. Find the six exact trig values:

$\sin A = -12/13$ $\csc A = -13/12$

$\cos A = 5/13$ $\sec A = 13/5$

$\tan A = -12/5$ $\cot A = -5/12$

2.   If $\sin B = -3/10$ in QIV, find the other five exact trig values:

$\sin B = -3/10$ $\csc B = -10/3$

$\cos B = \sqrt{91}/10$ $\sec B = 10/\sqrt{91}$

$\tan B = -3/\sqrt{91}$ $\cot B = -\sqrt{91}/3$

3.   If $\cot C = 15/8$ in QIII, find the other five exact trig values:

$\sin C = -8/17$ $\csc C = -17/8$

$\cos C = -15/17$ $\sec C = -17/15$

$\tan C = 8/15$ $\cot C = 15/8$

4.   Find the approximate values, in degrees, of A, B, and C above.

$A = $ ___$-67.380 \pm 360n$___

$B = $ ___$-17.458 \pm 360n$___

$C = $ ___$-151.928 \pm 360n$___

5. Find the approximate values of:

sin 106°= .961

tan -3.356= -.218

csc -546°= 9.567

sec 8.216= -2.824

cot 319° = -1.150

6. Find the approximate values (in degrees) of:

$\cos^{-1} .15 =$ $\pm 81.373 \pm 360n$

$\tan^{-1} 2.518 = \begin{cases} 68.340 \pm 360n \\ 248.340 \pm 360n \end{cases}$

$\csc^{-1} (-2.72) = \begin{cases} -21.571 \pm 360n \\ 201.571 \pm 360n \end{cases}$

$\sin^{-1} (-.325) = \begin{cases} -18.966 \pm 360n \\ 198.966 \pm 360n \end{cases}$

$\sec^{-1} 1.982 = \pm 59.699 \pm 360n$

7. A boat sails at 37 knots at a bearing of 213°. The current flows at 6 mph at 324°. Find the magnitude and bearing of the resultant vector.

$37\cos 213° \vec{\imath} + 37\sin 213° \vec{\jmath}$

$6\cos 324° \vec{\imath} + 6\sin 324° \vec{\jmath}$

$\vec{r} = -26.177\vec{\jmath} + (-23.678)\vec{\jmath}$

$|\vec{r}| = \sqrt{26.177^2 + \underset{23.678}{15.698^2}} = \underset{35.297}{30.319}$ mph

$\theta = -\cos^{-1}\dfrac{-26.177}{\underset{35.297}{30.319}} = -149.648° \quad -137.872°$

8. Identify the quadrant and reference angle of :

a) 875°   Q II $\theta_{ref} = 25°$

b) -629°   Q II $\theta_{ref} = 89°$

c) 3773°   Q II $\theta_{ref} = 7°$

d) -842°   Q III $\theta_{ref} = 58°$

9. Find the exact values of the following (using the Unit Circle values):

a) $\sin^2\dfrac{4\pi}{3}-2\cos^2\dfrac{3\pi}{4}$ $= \left(\dfrac{-\sqrt{3}}{2}\right)^2 - 2\left(\dfrac{-1}{\sqrt{2}}\right)^2$

$= \dfrac{3}{4} - 1 = -\dfrac{1}{4}$

b) $\sec\dfrac{\pi}{3}\tan\dfrac{\pi}{6}+\cot\dfrac{\pi}{2}\csc\dfrac{7\pi}{6}$ $= (2)\left(\dfrac{1}{\sqrt{3}}\right) + (0)\left(\dfrac{-\sqrt{3}}{2}\right)$

$= \dfrac{2}{\sqrt{3}}$

c) $\sec\left(\dfrac{11\pi}{6}\right)-\cos\left(\dfrac{3\pi}{2}\right)+\tan\left(-\dfrac{7\pi}{6}\right)$

$= \dfrac{2}{\sqrt{3}} - 0 + \dfrac{-1}{\sqrt{3}}$ $= \dfrac{1}{\sqrt{3}}$

10. $\vec{s}=-6\,\overline{i}+9\,\overline{j}$ and $\vec{r}=15\,\overline{i}-8\,\overline{j}$, find:

a. $3\,\overline{s}+2\,\overline{r}$ $= -18\vec{i}+27\vec{j} + 30\vec{i}-16\vec{j}$

$12\vec{i} + 11\vec{j}$

b. $\left|\overline{r}-4\,\overline{s}\right| = \left|39\vec{i} - 44\vec{j}\right| = \sqrt{39^2+44^2} =$

$= \sqrt{3457} = 58.796$

c. The unit vector in the direction $\overline{r}$ $= \dfrac{15\vec{i}-8\vec{j}}{17} = \dfrac{15}{17}\vec{i} - \dfrac{8}{17}\vec{j}$