Precalculus Acc '18-'19 Name SOLUTION Key
Trig Basics Test

1. $(-4, -7)$ is on the terminal side of A. Find the six exact trig values:

$r = \sqrt{65}$

$\sin A = -7/\sqrt{65}$ $\quad \csc A = -\sqrt{65}/7$

$\cos A = -4/\sqrt{65}$ $\quad \sec A = -\sqrt{65}/4$

$\tan A = 7/4$ $\quad \cot A = 4/7$

2. If $\sin B = -5/9$ in QIV, find the other five exact trig values:

$x = \sqrt{56} = 2\sqrt{14}$

$\sin B = -5/9$ $\quad \csc B = -9/5$

$\cos B = 2\sqrt{14}/9$ $\quad \sec B = 9/2\sqrt{14}$

$\tan B = -5/2\sqrt{14}$ $\quad \cot B = -\frac{2\sqrt{14}}{5}$

3. If $\tan B = 15/7$ in QIII, find the other five exact trig values:

$x = -7 \quad y = -15 \quad r = \sqrt{274}$

$\sin B = -15/\sqrt{274}$ $\quad \csc B = -\sqrt{274}/15$

$\cos B = -7/\sqrt{274}$ $\quad \sec B = -\sqrt{274}/7$

$\tan B = 15/7$ $\quad \cot B = 7/15$

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

$A =$ $-119.745 \pm 360°$

$B =$ $-33.749 \pm 360°$

$C =$ $-115.017 \pm 360°$

5. Find the approximate values of:

Cos -35= −.964

Tan -206°= −.488

Sec -.546= 1.170

Csc 7.26°= 7.913

Cot 30 = −.156

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

$\cos^{-1}$ .855= { ±31.240 ±360n

$\tan^{-1}$ 5.058= { 78.816 ±360n
258.516 ±360n

$\csc^{-1}$ -1.362= { −47.241 ±360n
227.241 ±360n

$\sin^{-1}$ (-.375)= { −22.024 ±360n
202.024 ±360n

$\sec^{-1}$ -.982= { NO SOLUTION

7. A boat sails 37 mph at a bearing of 113°. The current flows 5 mph at 274°. Find the magnitude and bearing of the resultant vector.

$37\cos 113^\circ \vec{i} + 37\sin 113^\circ \vec{j}$

$5\cos 274^\circ \vec{i} + 5\sin 274 \vec{j}$

$-14.108\vec{i} + 29.071\vec{j}$

$|\vec{r}| = \sqrt{14.108^2 + 29.071^2} = 32.313$ mph

$\theta = +\cos^{-1}\frac{-14.108}{32.313} = 115.888^\circ$

8. Identify the quadrant and reference angle of :

a) 585° Q III $\theta_{ref} = 45^\circ$

b) -472° Q III $\theta_{ref} = 68^\circ$

c) 2672° Q II $\theta_{ref} = 28^\circ$

d) -642° Q I $\theta_{ref} = 78$

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

(a) $\csc\frac{5\pi}{6}\tan\frac{3\pi}{4}\cos\frac{2\pi}{3}$ $= \frac{2}{1}(-1)\left(\frac{-1}{2}\right) = 1$

(b) $\sin\frac{\pi}{6}\cos\frac{\pi}{3}+\sin\frac{\pi}{3}\cos\frac{\pi}{6}$ $= \left(\frac{1}{2}\right)\left(\frac{1}{2}\right)+\left(\frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{3}}{2}\right)$

$= \frac{1}{4}+\frac{3}{4} = 1$

(c) $\cos\left(\frac{5\pi}{4}\right)-\sin\left(\frac{\pi}{2}\right)+\tan\left(\frac{13\pi}{6}\right)$ $= -\frac{1}{\sqrt{2}} - 1 + \left(\frac{1}{\sqrt{3}}\right) = \frac{-\sqrt{2}-6+\sqrt{3}}{6}$

10. $\vec{s} = 7\vec{i} - 11\vec{j}$ and $\vec{r} = 7\vec{i} - 24\vec{j}$, find:

a. $2\vec{s} - 3\vec{r}$ $= 14\vec{i} - 22\vec{j} - 21\vec{i} + 72\vec{j} = -7\vec{i} + 50\vec{j}$

b. $\left|\vec{r} - 4\vec{s}\right| = \left|7\vec{i} - 24\vec{j} - 28\vec{i} + 44\vec{j}\right| = \left|-21\vec{i} + 20\vec{j}\right|$

$= \sqrt{21^2 + 20^2} = \sqrt{841}$

$= 29$ units

c. The unit vector in the direction $\vec{s}$ $= \frac{7}{\sqrt{170}}\vec{i} - \frac{11}{\sqrt{170}}\vec{j}$

$|\vec{s}| = \sqrt{7^2 + 11^2}$

$= \sqrt{170}$