Key

1) Find the exact value of each expression:

$\frac{17}{6} - 2$

$\frac{17}{6} - \frac{12}{6} = \frac{5}{6}\pi$

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

$-\frac{4}{3} + \frac{6}{3} = \frac{2}{3}\pi$

a) $\csc 240°$

$\left(\frac{-1}{2}, \frac{-\sqrt{3}}{2}\right) \to \frac{-2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{-2\sqrt{3}}{3}}$
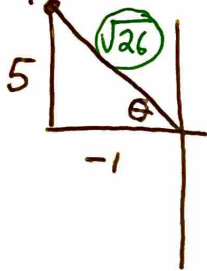
b) $\cot\frac{17}{6}\pi$ $\left(\frac{-\sqrt{3}}{2}, \frac{1}{2}\right)$

$\frac{-\sqrt{3}}{1} = \boxed{-\sqrt{3}}$

c) $\sec -\frac{4}{3}\pi$ $\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

$\frac{-2}{1} = \boxed{-2}$

2) The given point lies on the terminal side of an angle θ in the standard position. Find the values of all six trig functions of θ. Point P: (-1, 5)

P

$\sqrt{26}$

5

θ

-1

$(-1)^2 + 5^2 = c^2$

$26 = c^2$

$c = \sqrt{26}$

$\sin\theta = \frac{5}{\sqrt{26}} \to \boxed{\frac{5\sqrt{26}}{26}}$

$\cos\theta = \frac{-1}{\sqrt{26}} \to \boxed{\frac{-1\sqrt{26}}{26}}$

$\tan\theta = \frac{5}{-1} = \boxed{-5}$

$\csc\theta = \boxed{\frac{\sqrt{26}}{5}}$

$\sec\theta = \frac{\sqrt{26}}{-1} = \boxed{-\sqrt{26}}$

$\cot\theta = \boxed{\frac{-1}{5}}$

3) State the quadrant or axis where the terminal side of θ is found. Then, find the exact value of the specified trig function using the given information:

S	A
T	C

a) Find $\sec\theta$ if $\tan\theta = -1$ and $\csc > 0$

Quadrant: __Q2__ $\sec\theta$: $\boxed{-\sqrt{2}}$

$\tan < 0 \ (-)$ $\left(-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$

$\sin > 0 \ (+)$

$\frac{S|A}{T|C}$

$\sec\theta = \frac{2}{-\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} \to \frac{2\sqrt{2}}{-2} = -\sqrt{2}$

b) Find $\cos\theta$ if $\csc\theta$ is undefined and $\sec\theta < 0$ Quadrant: _negative X-axis_ $\cos\theta$: $\boxed{-1}$

$\sin\theta = 0$

$\boxed{(-1,0)}$ •————•$(1,0)$

c) If $\tan\theta = \frac{\sqrt{5}}{2}$ and $\sec\theta < 0$, then find $\csc\theta$ Quadrant: __Q3__ $\csc\theta$: $\boxed{\frac{-3\sqrt{5}}{5}}$

$\tan > 0 \ (+)$

$\cos < 0 \ (-)$

$\frac{S|A}{T|C}$

-2

-√5 θ ③

$(-2)^2 + (-\sqrt{5})^2 = c^2$

$3 = c$
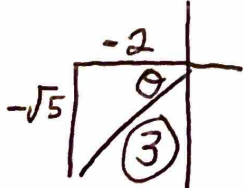
$\csc\theta = \frac{H}{O} \to \frac{3}{-\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}}$

$= \boxed{\frac{3\sqrt{5}}{-5}}$

4) Find all solutions in the given interval: $0 \le \theta \le 2\pi$

$\csc\theta = \frac{-2}{\sqrt{3}}$
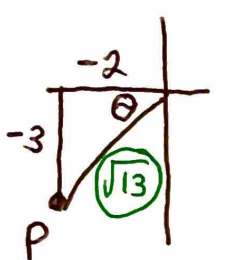
$\boxed{\theta = \frac{4\pi}{3}, \frac{5\pi}{3}}$

Q3, Q4

Key

1) Find the exact value of each expression:

$\frac{-11}{6}+2 \rightarrow \frac{-11}{6}+\frac{12}{6}=\frac{1\pi}{6}$

$\frac{11}{3}-2 \rightarrow \frac{11}{3}-\frac{6}{3}=\frac{5}{3}\pi$

d) $\sin 390°$

$390-360=30$

$\sin 30° \rightarrow \boxed{\frac{1}{2}}$

e) $\cot\frac{-11}{6}\pi$ $\left(\frac{\sqrt{3}}{2},\frac{1}{2}\right)$

$\frac{\sqrt{3}}{1}=\boxed{\sqrt{3}}$

f) $\csc\frac{11}{3}\pi$ $\left(\frac{1}{2},\frac{-\sqrt{3}}{2}\right)$

$\frac{-2}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}}=\boxed{\frac{-2\sqrt{3}}{3}}$

2) The given point lies on the terminal side of an angle θ in the standard position. Find the values of all six trig functions of θ. Point P: (-2, -3)
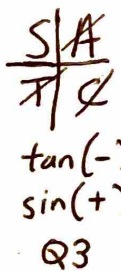
$(-2)^2+(-3)^2=c^2$

$c=\sqrt{13}$

$\sin\theta=\frac{-3}{\sqrt{13}} \rightarrow \boxed{\frac{-3\sqrt{13}}{13}}$

$\cos\theta=\frac{-2}{\sqrt{13}} \rightarrow \boxed{\frac{-2\sqrt{13}}{13}}$

$\tan\theta=\frac{-3}{-2}=\boxed{\frac{3}{2}}$

$\csc\theta=\boxed{\frac{-\sqrt{13}}{3}}$

$\sec\theta=\boxed{\frac{-\sqrt{13}}{2}}$
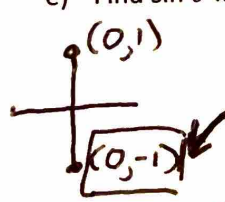
$\cot\theta=\boxed{\frac{2}{3}}$

3) State the quadrant or axis where the terminal side of θ is found. Then, find the exact value of the specified trig function using the given information:
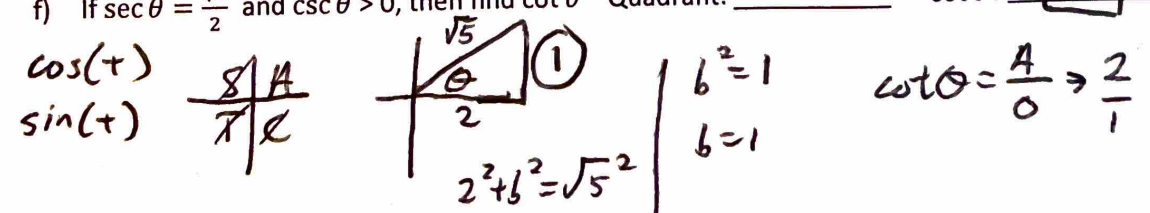
$\frac{S|A}{T|C}$

tan(-)
sin(+)
Q3

d) Find $\sec\theta$ if $\tan\theta=\frac{-\sqrt{3}}{}$ and $\csc>0$

$\left(\frac{-1}{2},\frac{\sqrt{3}}{2}\right)$

Quadrant: __Q2__ sec θ: __$\boxed{-2}$__

$\sec\theta=\frac{H}{A} \rightarrow \frac{-2}{1}$

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

e) Find $\sin\theta$ if $\sec\theta$ is undefined and $\csc\theta<0$

$\bullet(0,1)$

$\bullet(0,-1)$

sin(-)

Quadrant: __negative y-axis__ sin θ: __$\boxed{-1}$__

f) If $\sec\theta=\frac{\sqrt{5}}{2}$ and $\csc\theta>0$, then find $\cot\theta$

cos(+)
sin(+)

$\frac{S|A}{T|C}$

$2^2+b^2=\sqrt{5}^2$

$b^2=1$
$b=1$

Quadrant: __Q1__ cot θ: __$\boxed{2}$__

$\cot\theta=\frac{A}{O} \rightarrow \frac{2}{1}$

4) Find all solutions in the given interval: $0\le\theta\le360$

$\cot\theta=\frac{1}{\sqrt{3}}$

Q1, Q3

$\boxed{\theta=\frac{\pi}{3},\frac{4\pi}{3}}$