Complete the table of circular function values below for the 5 common angles in the first quadrant and on the positive $x-$ and $y-$axes.

SCORE: _____ / 6 PTS
(1 POINT DEDUCTED FOR EACH ERROR)

θ (in radians)	$\sin\theta$	$\cos\theta$
0	0	1
$\dfrac{\pi}{6}$	$\dfrac{1}{2}$	$\dfrac{\sqrt{3}}{2}$
$\dfrac{\pi}{4}$	$\dfrac{\sqrt{2}}{2}$	$\dfrac{\sqrt{2}}{2}$
$\dfrac{\pi}{3}$	$\dfrac{\sqrt{3}}{2}$	$\dfrac{1}{2}$
$\dfrac{\pi}{2}$	1	0

Use the table above to fill in the blanks below. Simplify all answers (including rationalizing denominators). Write "UNDEFINED" if the expression has no value.

SCORE: _____ / 4 PTS

[a] $\tan\dfrac{\pi}{2} = $ __UNDEFINED__ $\quad \dfrac{\sin\frac{\pi}{2}}{\cos\frac{\pi}{2}} = \dfrac{1}{0}$

[b] $\sec 0 = $ ___1___ $\quad \dfrac{1}{\cos 0} = \dfrac{1}{1}$

[c] $\cot\dfrac{\pi}{3} = $ __$\dfrac{\sqrt{3}}{3}$__ $\quad \dfrac{\cos\frac{\pi}{3}}{\sin\frac{\pi}{3}} = \dfrac{\frac{1}{2}}{\frac{\sqrt{3}}{2}}$

[d] $\csc\dfrac{\pi}{6} = $ ___2___ $\quad \dfrac{1}{\sin\frac{\pi}{6}} = \dfrac{1}{\frac{1}{2}}$

Suppose $\sin t = -\dfrac{8}{17}$ and $\cos t = \dfrac{15}{17}$. Fill in the blanks below. Simplify all answers.

SCORE: _____ / 4 PTS

[a] $\sec t = $ __$\dfrac{17}{15}$__ $\quad \dfrac{1}{\cos t} = \dfrac{1}{\frac{15}{17}}$

[b] $\sec(-t) = $ __$\dfrac{17}{15}$__ $\quad \sec t$

[c] $\cot t = $ __$\dfrac{-15}{8}$__ $\quad \dfrac{\cos t}{\sin t} = \dfrac{\frac{15}{17}}{\frac{-8}{17}}$

[d] $\sin(-t) = $ __$\dfrac{8}{17}$__ $\quad -\sin t$

Fill in the blanks below. Simplify all answers (including rationalizing denominators).   **SCORE:** _____ **/ 5 PTS**
Write "UNDEFINED" if the expression has no value.

[a] $-\dfrac{19\pi}{6}$ is co-terminal with ___ $\dfrac{5}{6}\pi$ ___ (**NOTE**: Your answer must be between 0 and 2π) $-3\tfrac{1}{6}\pi + 2(2\pi)$

[b] $\cos\left(-\dfrac{19\pi}{6}\right) =$ ___ $-\dfrac{\sqrt{3}}{2}$ ___ LIKE $\cos\dfrac{\pi}{6}$
BUT NEGATIVE   [c] The complement of $\dfrac{2\pi}{5}$ radians is ___ $\dfrac{\pi}{10}$ ___ $\dfrac{\pi}{2} - \dfrac{2\pi}{5}$
SINCE IN Q_2 (WHERE X<0)

[d] $\dfrac{7\pi}{20}$ radians = ___ 63 ___ degrees $\dfrac{7\pi}{20} * \dfrac{180}{\pi}$ [e] 72 degrees = ___ $\dfrac{2\pi}{5}$ ___ radians $72 * \dfrac{\pi}{180}$

In the diagram of a central angle on the right,
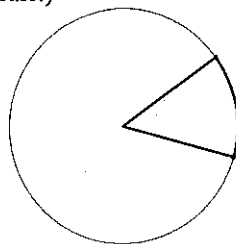the radius of the circle is 12 mm and the intercepted arc has length 15 mm. (NOTE: The diagram is **NOT** drawn to scale.)

[a] The central angle is $\dfrac{5}{4}$ radians.

$S = r\theta \rightarrow \theta = \dfrac{S}{r} = \dfrac{15mm}{12mm}$

[b] The area of the intercepted sector is $\underline{90mm^2}$.

$A = \dfrac{1}{2}r^2\theta = \dfrac{1}{2}(12mm)^2\left(\dfrac{5}{4}\right)$

[c] If an object is moving around the circle at a linear speed of 60 mm/s,

its angular speed is $\underline{5}$ RADIANS/SECOND.
(specify the units)

$V = r\omega \rightarrow \omega = \dfrac{V}{r} = \dfrac{60\,mm/s}{12mm}$