1) $\cos \theta$ *if* $\sec \theta = \dfrac{5}{3}$

2) $\sin \theta$ *if* $\csc \theta = -\dfrac{\sqrt{12}}{2}$

3/5

$\dfrac{-2\sqrt{12}}{12} = -\dfrac{\sqrt{12}}{6}$

3) The terminal side of an angle θ in standard position goes through the point (-8, 15). Find the values of the six trigonometric functions of angle θ.

Cos = -8/17   Sin = 15/17

Sec = -17/8   Cosec = 17/15

Tan = 15/-8   Cotan = -8/15

4) Let P be a point on the **unit circle** which is on the terminal side of angle θ. Assume P has coordinates $\left(\dfrac{1}{2}, -\dfrac{\sqrt{3}}{2}\right)$. Find the six trigonometric function values of θ.

Cos = ½   sin = $-\dfrac{\sqrt{3}}{2}$

Sec = 2   Cosec = $\dfrac{-2\sqrt{3}}{3}$

Tan = $-\sqrt{3}$ Cotan = $\dfrac{-\sqrt{3}}{3}$

5) Find the exact value without using a calculator:

a) $\tan\dfrac{3\pi}{4}$ =-1

b) $\sec\left(\dfrac{2\pi}{3}\right) = -2$

c) $\csc\left(\dfrac{7\pi}{6}\right)$ =-2

d) $\cot\left(\dfrac{5\pi}{4}\right) = 1$

6) Verify the **identity** $\dfrac{\sin\theta}{\cos\theta} = \tan\theta$. You will use this frequently!

$\dfrac{\sin\theta}{\cos\theta} = \dfrac{opp/hyp}{adj/hyp} = \dfrac{opp}{hyp}$ or do an example

7) At what values of θ is $\tan\theta$ equal to 1? At what values of is $\tan\theta$ equal to -1? $\pi/4, 5\pi/4$ for 1, $3\pi/4, 7\pi/4$

THE SIX TRIG FUNCTION VALUES OF QUADRANTAL ANGLES

8) If the terminal side of a quadrantal angle lies along the **y-axis**, the **tangent** and **secant** functions are undefined. If it lies on the **x-axis**, the **cotangent** and **cosecant** functions are undefined. Explain why. _In each case the denominator of the ratio is 0._____

9) Complete the table for the quadrantal angles of 0°, 90°, 180°, 270°, and 360° and use it for future reference:

QUADRANTAL ANGLES

θ	$\sin\theta$	$\cos\theta$	$\tan\theta$	$\csc\theta$	$\sec\theta$	$\cot\theta$
0° or 0	0	1	0	Undef	1	Undef
90° or $\frac{\pi}{2}$	1	0	Undef	1	Undef	0
180° or π	0	-1	0	Undef	-1	Undef
270° or $\frac{3\pi}{2}$	-1	0	Undef	-1	Undef	0
360° or 2π	0	1	0	Undef	1	0

10) For any non-quadrantal angle θ, $\sin\theta$ and $\csc\theta$ will have the same sign. Explain why. __csc=hyp/opp, sin=opp/hyp, those fractions, having the same components, will always have the same sign.

11) $\cos 90° + 3\sin 270° =$ _____-3_____

12) $\csc 270° + 2 \cdot \tan(135°) =$ ____-3_____

SIGNS OF FUNCTION VALUES

θ in quadrant	$\sin\theta$	$\cos\theta$	$\tan\theta$	$\cot\theta$	$\sec\theta$	$\csc\theta$
I	+	+	+	+	+	+
II	+	-	-	-	-	+
III	-	-	+	+	-	-
IV	-	+	-	-	+	-

13) Identify the quadrant (or quadrants) for any angle θ that satisfies $\sin\theta > 0$ *and* $\tan\theta < 0$. __II_____

14) If θ is a second-quadrant angle and $\tan\theta = -\frac{3}{4}$, find the values of the other five trigonometric functions. Make a sketch to help.

Sin=3/5   cos=-4/5   tan=-3/4   Csc=5/3   sec=-5/4   Cotan=4/3

15) If $\sec 15° \approx 1.035$, give the approximate value of (**NO** calculators!)

a) $\sec(-15°)$ b) $\sec 165°$ c) $\sec 345°$

1.035   -1.035   1.035

16) Use your calculator to find the value of each to 4 decimal places.

a) tan 2   b) cot 185°   c) csc 3   d) sec (-22°)

-2.1850   11.4301   7.0862   1.0785