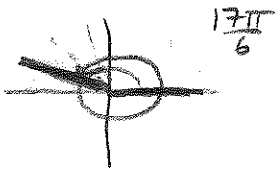
Pre Calculus
4.1-4.4 Review #1

Name Solutions

Period

#1. Sketch the angle $\theta = \frac{17\pi}{6}$ in standard position.

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



#2. Convert $\frac{2\pi}{7}$ to degrees (round to nearest degree)

$\frac{2\pi}{7}\left(\frac{180°}{\pi}\right) = \frac{2 \cdot 180}{7} = 51.4$ **51°**

#3. Convert 198.7° to radians (round to four decimals)

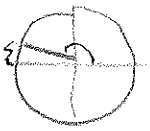
$198.7°\left(\frac{\pi}{180°}\right) = 3.467969$ **3.4680**

#4. Find **two** angles (one positive and one negative) that are coterminal to $-\frac{11\pi}{5}$.

$-\frac{11\pi}{5} + \frac{10\pi}{5} = -\frac{\pi}{5}$ (2π) $+\frac{10\pi}{5} = \frac{9\pi}{5}$

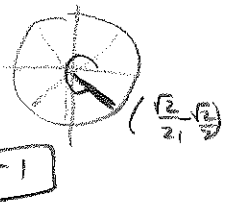
#5. Find the **exact value** (use the unit circle) of the following trigonometric functions:

a. $\sin\left(\frac{5\pi}{6}\right)$ $= \frac{1}{2}$



b. $\cos\left(\frac{2\pi}{3}\right)$ $= -\frac{1}{2}$

c. $\tan\left(\frac{7\pi}{4}\right)$ $= \frac{-\sqrt{2}/2}{\sqrt{2}/2} = -1$



#6. Evaluate $\cos 43°28'$. Round your result to four decimals.

(calculator angle menu) **0.7258**

#7. Use a calculator to evaluate (round to four decimals):

a. $\tan\frac{2\pi}{7} = 1.25396$ **1.2540**

b. $\sec 2.4 = \frac{1}{\cos 2.4} = \frac{1}{-.73739} =$ **−1.3561**

#8. What is the complement of $\frac{3\pi}{14}$?

add to $\frac{\pi}{2}$:

$\frac{\pi}{2} - \frac{3\pi}{14} = \frac{7\pi}{14} - \frac{3\pi}{14} = \frac{4\pi}{14} =$ **$\frac{2\pi}{7}$**

#9. What is the supplement of $\frac{11\pi}{15}$?

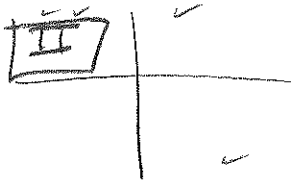
add to π:

$\pi - \frac{11\pi}{15} = \frac{15\pi}{15} - \frac{11\pi}{15} =$ **$\frac{4\pi}{15}$**

#10. If $\sin\theta > 0$ and $\cot\theta < 0$, in which quadrant does θ lie?

(tan(−))

II

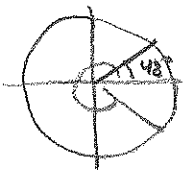


#11. If $\cos\theta = 0.673$, find **two** values of θ to the nearest degree for $0° \le \theta < 360°$

$\cos^{-1}(\cos\theta) = \cos^{-1}(.673)$

$\theta = \cos^{-1}(.673)$

$\theta = 47.7 = \boxed{48°}$



2nd angle is across X-axis

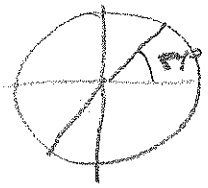
$360° - 48° = \boxed{312°}$

#12. If $\tan\theta = 1.3544$, find **two** values of θ to the nearest degree for $0° \le \theta < 360°$

$\theta = \tan^{-1}(1.3544)$

$\theta = 53.56$

$= \boxed{54°}$



2nd angle is across circle

$54° + 180° = \boxed{234°}$

#13. If $\csc\theta = \frac{3}{2}$, what is $\sin(-\theta)$?

$\sin\theta = \frac{2}{3}$ so $\sin(-\theta) = \boxed{-\frac{2}{3}}$

$\sin(-\theta) = -\sin(\theta)$ (odd)

#14. If $\csc\theta = \frac{3}{4}$, what is $\sec\left(\frac{\pi}{2} - \theta\right)$?

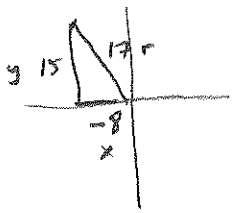
← cofunction

So $\sec\left(\frac{\pi}{2} - \theta\right) = \boxed{\frac{3}{4}}$

#15. If (-8, 15) is a point on the terminal side of θ, what is $\sec\theta$?

$\cos\theta = \frac{x}{r} = \frac{-8}{17}$

$\sec\theta = \frac{1}{\cos\theta} = \boxed{-\frac{17}{8}}$



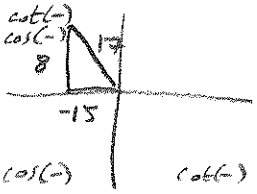
#16. Given $\cot\theta = -\frac{15}{8}$ and $\cos\theta < 0$, find the **exact values** of $\sin\theta$ and $\sec\theta$.

$\tan\theta = -\frac{8}{15}$ y x

$\sin\theta = \frac{y}{r} = \boxed{\frac{8}{17}}$

$\cos\theta = \frac{x}{r} = \frac{-15}{17}$

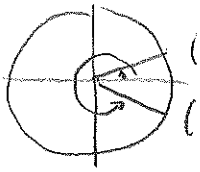
$\sec\theta = \frac{1}{\cos\theta} = \boxed{-\frac{17}{15}}$



#17. Given $\sec\theta = \frac{2\sqrt{3}}{3}$ find the **two exact values** of θ for $0 \le \theta < 2\pi$

$\cos\theta = \frac{3\sqrt{3}}{2\sqrt{3}\sqrt{3}}$

$\cos\theta = \frac{3\sqrt{3}}{2 \cdot 3} = \frac{\sqrt{3}}{2}$

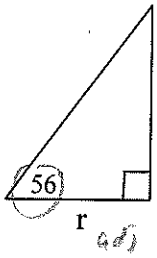


$\theta = \boxed{\frac{\pi}{6} \text{ and } \frac{11\pi}{6}}$

#18. Find the exact length (answer in terms of pi) of the arc on a circle that has a radius of 12 meters intercepted by a central angle $\theta = 61°$.

$s = r\theta_{rad}$ $\quad s = (12)\left(61° \cdot \frac{\pi}{180°}\right) = \boxed{\frac{61\pi}{15} \text{ m}}$

#19. Solve for r. (round answer to 3 decimals)



$\tan\theta = \frac{opp}{adj}$

$\tan 56° = \frac{8}{r}$

$r \tan 56° = 8$

$r = \frac{8}{\tan 56°} = \boxed{5.396 \text{ cm}}$

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