Pre-Calculus **Name:** Key

Unit 1 Review- Basics of Trig

Determine the exact values of the six trig functions that correspond to the given point.

1. (4, 3) — $r=5$; $\sin\theta=\frac{3}{5}$, $\cos\theta=\frac{4}{5}$, $\tan\theta=\frac{3}{4}$, $\csc\theta=\frac{5}{3}$, $\sec\theta=\frac{5}{4}$, $\cot\theta=\frac{4}{3}$

2. (-4, 1) — $r=\sqrt{17}$; $\sin\theta=\frac{\sqrt{17}}{17}$, $\cos\theta=-\frac{4\sqrt{17}}{17}$, $\tan\theta=-\frac{1}{4}$, $\csc\theta=\sqrt{17}$, $\sec\theta=\frac{\sqrt{17}}{-4}$, $\cot\theta=-4$

State the quadrant in which the terminal ray of θ lies.

3. $\sin\theta<0$ and $\cos\theta<0$ — III

4. $\sin\theta>0$ and $\tan\theta<0$ — II

5. $\sin\theta>0$ and $\cos\theta>0$ — I

6. $\tan\theta<0$ and $\sec\theta>0$ — IV

Find the values of the six trig functions.

7. $\sin\theta=\frac{3}{5}$, $x=4$, θ is in Quadrant II — $\sin\theta=\frac{3}{5}$, $\cos\theta=-\frac{4}{5}$, $\tan\theta=-\frac{3}{4}$, $\csc\theta=\frac{5}{3}$, $\sec\theta=-\frac{5}{4}$, $\cot\theta=-\frac{4}{3}$

8. $\tan\theta=-\frac{15}{8}$ and $\sin\theta<0$ — $r=\sqrt{15^2+8^2}=17$; $\tan\theta=-\frac{15}{8}$, $\sin\theta=-\frac{15}{17}$, $\cos\theta=\frac{8}{17}$, $\cot\theta=-\frac{8}{15}$, $\csc\theta=-\frac{17}{15}$, $\sec\theta=\frac{17}{8}$

Find the reference angles.

9. $295°$ — $360-295=65°$

10. $85°$ — $85°$

11. $\frac{3\pi}{4}$ — $\pi/4$

12. $\frac{11\pi}{6}$ — $\pi/6$

Find one co terminal angle with counter-clockwise rotation AND with clockwise rotation for the given angle.

13. $261°$ — CCW $+360°=621°$; CW $-360°=-99°$

14. $\frac{5\pi}{11}$ — CCW $+2\pi=\frac{27\pi}{11}$; CW $-2\pi=-\frac{17\pi}{11}$

15. What does it mean for an angle to be in standard position?
vertex @ origin; one ray on positive x-axis (initial side); other ray is "anywhere" (terminal side)

16. How do you convert degrees to radians? AND then radians to degrees?
D → R mult. by $\pi/180°$
R → D mult. by $180°/\pi$

Vocabulary/Topics to Know:
- standard position
- terminal ray
- initial ray
- quadrantal angles
- negative angles vs. positive angles
- radian measure vs. degree measure
- coterminal angles
- reference angles
- Unit Circle
- undefined

17. Write an equation of the sine function with amplitude 1/2, period 2, and vertical shift down 4.
$y=\frac{1}{2}\sin\pi x-4$ ($2=\frac{2\pi}{b}$ so $b=\pi$)

18. State the period of the function $y=\sin(\pi/4\,x)$. _____ $per=\frac{2\pi}{\pi/4}=8$

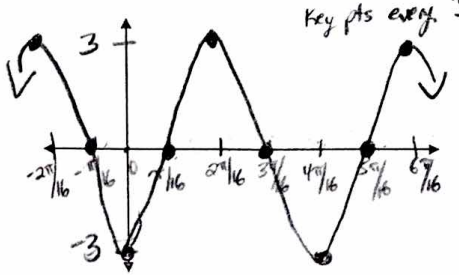
19. **Where** does the maximum value occur [0,2π) for the function $y=-3\cos(x+\pi/4)$ _____
max usually @ $x=0$ for $\cos x$. w/ reflection $-\cos x$ max @ π. But... P.S. $\frac{\pi}{4}$ to left, max now @ $x=\frac{3\pi}{4}$

20. **Where** do the asymptotes occur for one period of $y=\csc(x)+1$? _____ ($P=2\pi$)
asym. for csc(x) happen where $\sin(x)=0$ so for $[0,2\pi)$, asym @ $x=0$ and $x=\pi$

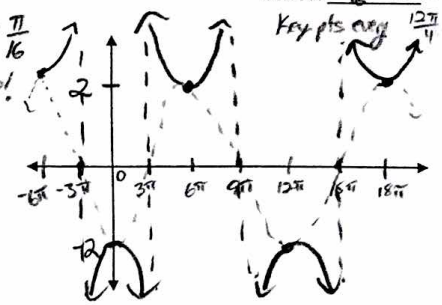
45/50

Graph. Fill in the blanks and label key points.

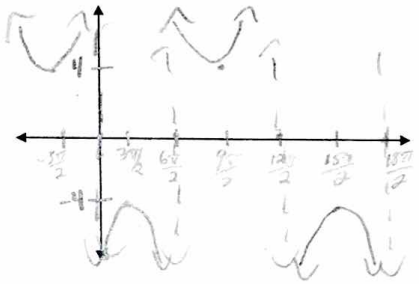
21. $y=-3\cos 8x$ — Amp: 3; Period: $\frac{2\pi}{8}=\frac{\pi}{4}$; Key pts every $\frac{\pi/4}{4}=\frac{\pi}{16}$



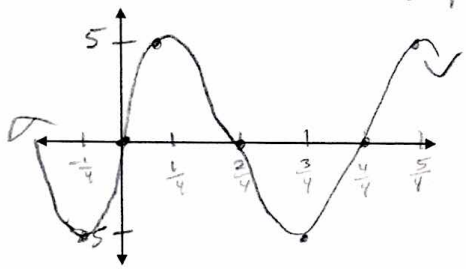
22. $y=-2\sec\frac{x}{6}$ — think $-\cos x$! Amp: none! Period: $\frac{2\pi}{1/6}=12\pi$; Key pts every $\frac{12\pi}{4}=3\pi$



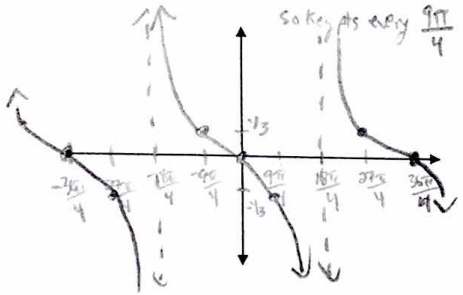
23. $y=-4\csc\frac{x}{3}$ — think $-\sin x$! Amp: none! Period: $\frac{2\pi}{1/3}=6\pi$; Key pts every $\frac{6\pi}{4}=\frac{3\pi}{2}$



24. $y=5\sin 2\pi x$ — Amp: 5; Period: $\frac{2\pi}{2\pi}=1$; so key pts every $\frac{1}{4}$



25. $y=\frac{-1}{3}\tan\frac{x}{9}$ — reflection, vert comp. 1/3; Amp: none! Period: $\frac{\pi}{1/9}=9\pi$; so key pts every $\frac{9\pi}{4}$



26. $y=2\cot 3x$ — vert stretch 2; Amp: none! Period: $\frac{\pi}{3}$; key pts every $\frac{\pi/3}{4}=\frac{\pi}{12}$