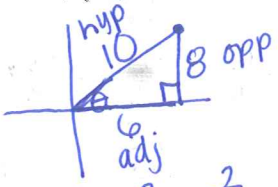
Algebra 2 Name: *Key*

13-3 Practice (Pg. 23), Exact Values of Trig Functions & Unit Circle

All work must be shown to receive full credit. SOH CAH TOA

Find the exact values of the six trigonometric functions of θ if the terminal side of θ in standard position contains the given point. NOT ON UNIT CIRCLE $r \neq 1$

1. (6, 8)



$6^2+8^2=r^2$

$100=r^2$

$10=r$

#1 $\sin\theta=\frac{4}{5}$ $\csc\theta=\frac{5}{4}$

$\cos\theta=\frac{3}{5}$ $\sec\theta=\frac{5}{3}$

$\tan\theta=\frac{4}{3}$ $\cot\theta=\frac{3}{4}$

2. (−20, 21)

#2 $\sin\theta=21/29$ $\csc\theta=29/21$

$\cos\theta=-20/29$ $\sec\theta=-29/20$

$\tan\theta=-\frac{21}{20}$ $\cot\theta=-20/21$

3. (−2, −5)

#3 $\sin\theta=\frac{-5\sqrt{29}}{29}$ $\csc\theta=-\frac{\sqrt{29}}{5}$

$\cos\theta=\frac{-2\sqrt{29}}{29}$ $\sec\theta=-\frac{\sqrt{29}}{2}$

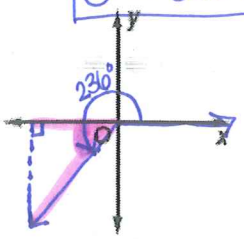
$\tan\theta=\frac{}{2}$ $\cot\theta=\frac{2}{5}$

Sketch each angle. Then find its reference angle. → θ' (inside △)

4. 236°

$\theta'=236°-180°$

$\theta'=56°$

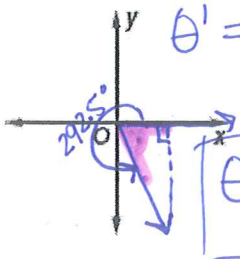


5. $\frac{13\pi}{8}$ $\frac{180°}{\pi}=292.5°$

$\theta'=360°-292.5°$

$\theta'=67.5°$ $\frac{\pi}{180°}$

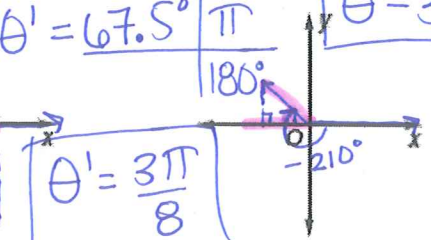
$\theta'=\frac{3\pi}{8}$



6. −210°

$\theta'=210°-180°$

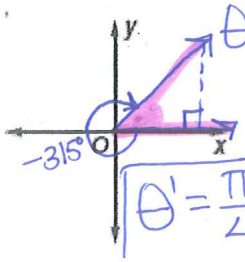
$\theta'=30°$



7. $-\frac{7\pi}{4}=-315°$

$\theta'=360°-315°$

$\theta'=45°$



$\theta'=\frac{\pi}{4}$

You must show your work for the following problems. This includes drawing a picture.

*draw △s & label

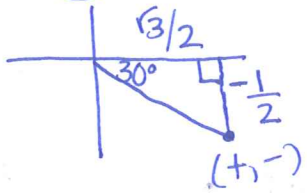
Find the exact value of each trigonometric function. *UNIT CIRCLE*

10. $\sin 150°$ $\frac{1}{2}$

11. $\cos 270°$ 0

12. $\cot 135°$ -1

13. $\tan(-30°)$ $-\frac{\sqrt{3}}{3}$



$\tan\theta = \frac{o}{a} = \frac{-\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{-1}{2} \cdot \frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{-\sqrt{3}}{3}$

14. $\tan\frac{\pi}{4}$ 1

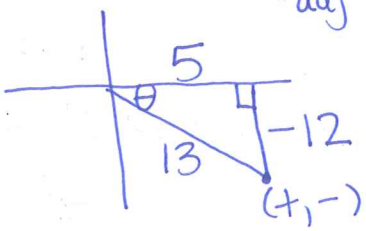
15. $\cos\frac{4\pi}{3}$ $-\frac{1}{2}$

16. $\cot(-\pi)$ undefined

17. $\sin\left(-\frac{3\pi}{4}\right)$ $-\frac{\sqrt{2}}{2}$

Suppose θ is an angle in standard position whose terminal side is in the given quadrant. For each function, find the exact values of the remaining five trigonometric functions of θ. *NOT UNIT CIRCLE* $r \neq 1$

16. $\tan\theta = -\frac{12}{5}$ (opp / adj), Quadrant IV



$5^2 + (-12)^2 = r^2$

$25 + 144 = r^2$

$13 = r$

$\sin\theta = \frac{-12}{13}$ $\quad \csc\theta = \frac{-13}{12}$

$\cos\theta = \frac{5}{13}$ $\quad \sec\theta = \frac{13}{5}$

$\tan\theta = \frac{-12}{5}$ $\quad \cot\theta = \frac{-5}{12}$

17. $\sin\theta = \frac{-2}{3}$, Quadrant III TYPO!

#17

$\sin\theta = -\frac{2}{3}$ $\quad \csc\theta = -\frac{3}{2}$

$\cos\theta = -\frac{\sqrt{5}}{3}$ $\quad \sec\theta = -\frac{3\sqrt{5}}{5}$

$\tan\theta = -\frac{2\sqrt{5}}{5}$ $\quad \cot\theta = -\frac{\sqrt{5}}{2}$