

Key 13-3

Skills Practice

13-3 Skills Practice

NAME _____ DATE _____ PERIOD _____

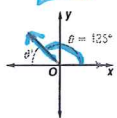
Trigonometric Functions of General Angles

Find the exact values of the six trigonometric functions of θ if the terminal side of θ in standard position contains the given point.

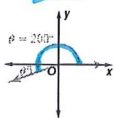
1. (5, 12)
 $\sin \theta = \frac{12}{13}$, $\cos \theta = \frac{5}{13}$, $\tan \theta = \frac{12}{5}$,
 $\csc \theta = \frac{13}{12}$, $\sec \theta = \frac{13}{5}$, $\cot \theta = \frac{5}{12}$
2. (3, 4)
 $\sin \theta = \frac{4}{5}$, $\cos \theta = \frac{3}{5}$, $\tan \theta = \frac{4}{3}$,
 $\csc \theta = \frac{5}{4}$, $\sec \theta = \frac{5}{3}$, $\cot \theta = \frac{3}{4}$
3. (8, -15)
 $\sin \theta = -\frac{15}{17}$, $\cos \theta = \frac{8}{17}$, $\tan \theta = -\frac{15}{8}$,
 $\csc \theta = -\frac{17}{15}$, $\sec \theta = \frac{17}{8}$, $\cot \theta = -\frac{8}{15}$
4. (-4, 3)
 $\sin \theta = \frac{3}{5}$, $\cos \theta = -\frac{4}{5}$, $\tan \theta = -\frac{3}{4}$,
 $\csc \theta = \frac{5}{3}$, $\sec \theta = -\frac{5}{4}$, $\cot \theta = -\frac{4}{3}$
5. (-9, -40)
 $\sin \theta = -\frac{40}{41}$, $\cos \theta = -\frac{9}{41}$, $\tan \theta = \frac{40}{9}$,
 $\csc \theta = -\frac{41}{40}$, $\sec \theta = -\frac{41}{9}$, $\cot \theta = \frac{9}{40}$
6. (1, 2)
 $\sin \theta = \frac{2\sqrt{5}}{5}$, $\cos \theta = \frac{\sqrt{5}}{5}$, $\tan \theta = 2$,
 $\csc \theta = \frac{\sqrt{5}}{2}$, $\sec \theta = \sqrt{5}$, $\cot \theta = \frac{1}{2}$

Sketch each angle. Then find its reference angle.

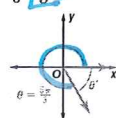
7. 135° 45°



8. 200° 20°



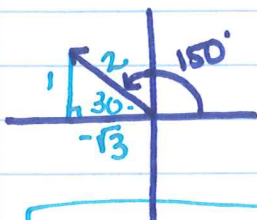
9. $\frac{5\pi}{3}$ $\frac{\pi}{3}$



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Find the exact values:

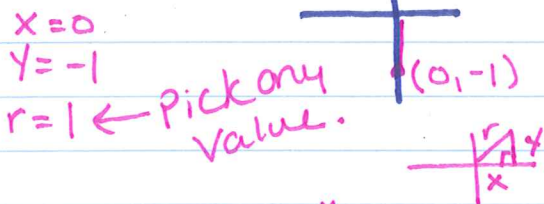
10.) $\sin 150^\circ$



$\sin(150^\circ) = \frac{1}{2}$

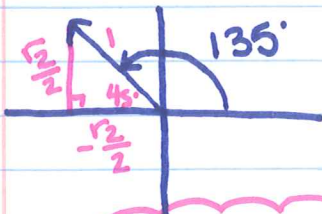
← must draw out every time.

11.) $\cos 270^\circ$



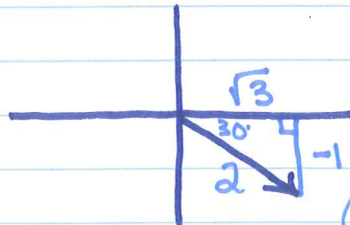
$\cos(270^\circ) = \frac{x}{r}$
 $\cos(270^\circ) = \frac{0}{1} \Rightarrow \cos(270^\circ) = 0$

12.) $\cot 135^\circ = \frac{\text{adj.}}{\text{opp.}} = \frac{-\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = -1$



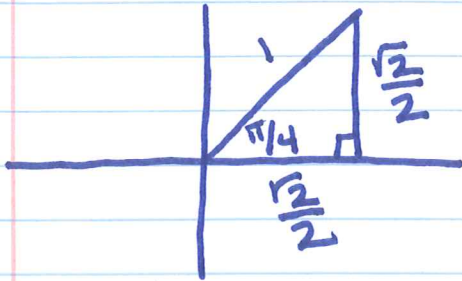
$\cot 135^\circ = -1$

13.) $\tan(-30^\circ) = \frac{\text{op}}{\text{adj}} = \frac{-1}{\sqrt{3}} = -\frac{1}{\sqrt{3}}$



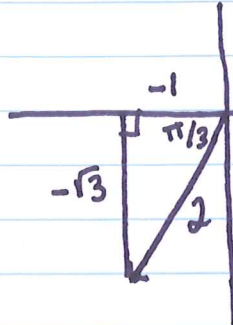
$\frac{-1 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = -\frac{\sqrt{3}}{3}$
 $\tan(-30^\circ) = -\frac{\sqrt{3}}{3}$

$$14.) \tan \frac{\pi}{4} = \frac{\text{op}}{\text{adj}} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}}$$



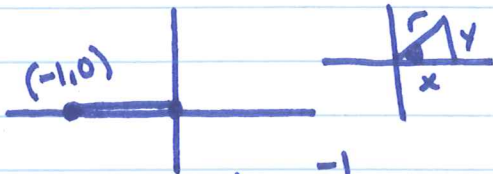
$$\tan \frac{\pi}{4} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} \Rightarrow \tan \frac{\pi}{4} = 1$$

$$15.) \cos \frac{4\pi}{3} = \frac{\text{adj}}{\text{hyp.}}$$



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

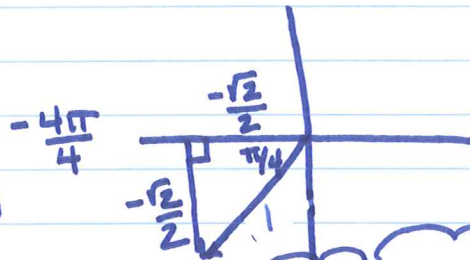
$$16.) \cot(-\pi) = \frac{\text{adj.}}{\text{opp.}} = \frac{x}{y}$$



$$\cot(-\pi) = \frac{-1}{0} = \text{undefined}$$

$$\cot(-\pi) = \text{undefined}$$

$$17.) \sin(-\frac{3\pi}{4}) = \frac{\text{op.}}{\text{hyp.}} = \frac{-\frac{\sqrt{2}}{2}}{1}$$



$$\sin(-\frac{3\pi}{4}) = -\frac{\sqrt{2}}{2}$$

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 .

18. $\sin \theta = \frac{4}{5}$, Quadrant II

$$\cos \theta = -\frac{3}{5}, \tan \theta = -\frac{4}{3}, \csc \theta = \frac{5}{4},$$

$$\sec \theta = -\frac{5}{3}, \cot \theta = -\frac{3}{4}$$

19. $\tan \theta = -\frac{12}{5}$, Quadrant IV

$$\sin \theta = -\frac{12}{13}, \cos \theta = \frac{5}{13}, \csc \theta = -\frac{13}{12},$$

$$\sec \theta = \frac{13}{5}, \cot \theta = -\frac{5}{12}$$