1. Find the reference angle of each:

a) $-415°$ $55°$

b) $\dfrac{17\pi}{3}$ $\dfrac{\pi}{3}$

c) $-\dfrac{13\pi}{5}$ $\dfrac{2\pi}{5}$

2. Point $P(3,-5)$ is on the terminal arm of an angle θ in standard position. What is the value of $\csc\theta$?

$r=\sqrt{34}$ $\csc\theta = \dfrac{-\sqrt{34}}{5}$

3. If θ is in standard position and its terminal arm is in quadrant III, what is the value of $\cos\theta$ if $\cot\theta = \dfrac{3}{\sqrt{13}}$?

$r=\sqrt{22}$ $\cos\theta = \dfrac{-3}{\sqrt{22}}$

4. If θ is in standard position and its terminal arm is in quadrant II, what is the value of $\cot\theta$ if $\sin\theta = a$?

$\cot\theta = \dfrac{x}{y} = \dfrac{-\sqrt{1-a^2}}{a}$

5. If θ is in standard position and its terminal arm is in quadrant IV, what is the value of $\tan\theta$ if $\sin\theta = m$?

$\tan\theta = \dfrac{m}{\sqrt{1-m^2}}$

6. If $\cot\theta = -\dfrac{4}{3}$ and $\sin\theta < 0$, what is the exact value of $\sec\theta$?

$\sec\theta = \dfrac{5}{4}$

7. If $\dfrac{\pi}{2} \le \theta \le \dfrac{3\pi}{2}$ and $\tan\theta = -\dfrac{5}{6}$, what is the exact value of $\csc\theta$?

$= \dfrac{\sqrt{61}}{5}$

8. Find the exact value of each trigonometric function:

a) $\sin\dfrac{\pi}{4}$ $= \dfrac{1}{\sqrt{2}}$

b) $\tan\dfrac{10\pi}{3}$ $= \sqrt{3}$

c) $\sin150°$ $= \dfrac{1}{2}$

d) $\csc(-120°)$ $= \dfrac{-2}{\sqrt{3}}$

e) $\tan\left(-\dfrac{3\pi}{4}\right)$ $= 1$

f) $\cos\left(-\dfrac{13\pi}{6}\right)$ $= \dfrac{\sqrt{3}}{2}$

g) $\sec\left(\dfrac{-11\pi}{6}\right)$ $= \dfrac{2}{\sqrt{3}}$

h) $\cot5\pi$ $= $ undefined

i) $\sec\left(-\dfrac{5\pi}{4}\right)$ $= -\sqrt{2}$

j) $\cot300°$ $= -\dfrac{1}{\sqrt{3}}$

k) $\tan\dfrac{5\pi}{6}$ $= -\dfrac{1}{\sqrt{3}}$

l) $\sec\dfrac{7\pi}{4}$ $= \sqrt{2}$

m) $\csc\left(-\dfrac{2\pi}{3}\right)$ $= -\dfrac{2}{\sqrt{3}}$

n) $\cos\dfrac{7\pi}{2}$ $= 0$

1. Convert each angle to degrees:

   a) $\dfrac{5\pi}{12} \cdot \dfrac{180°}{\pi}$ $75°$

   b) $-2.7 \cdot \dfrac{180°}{\pi} = -154.7°$

2. Convert each angle to radians. Leave answers in exact values terms of π.

   a) $-405°$ $\times \dfrac{\pi}{180°} = -\dfrac{9\pi}{4}$

   b) $80°$ $\times \dfrac{\pi}{180°} = \dfrac{4\pi}{9}$

3. Find the i) reference angle ii) principal angle and iii) two coterminal angles of each:

   a) $610°$ i) $70°$ iii) $-110°$
              ii) $260°$ $970°$

   b) $-\dfrac{15\pi}{8}$ i) $\dfrac{\pi}{8}$ iii) $-\dfrac{31\pi}{8}$
                       ii) $\dfrac{\pi}{8}$ $\dfrac{17\pi}{8}$

4. Determine the exact value of each:

   a) $\sin\left(-\dfrac{3\pi}{2}\right) = 1$

   b) $\cos\dfrac{3\pi}{4} = -\dfrac{1}{\sqrt{2}}$

   c) $\csc\left(-\dfrac{5\pi}{6}\right) = -2$

   d) $\cot\dfrac{7\pi}{6} = \sqrt{3}$

   e) $\sec(-210°) = -\dfrac{2}{\sqrt{3}}$

   f) $\tan\dfrac{15\pi}{4} = 0$

   g) $\csc 675° = -\sqrt{2}$

   h) $\cos(-900°) = -1$

5. If $\cos\theta = -\dfrac{1}{3}$ and $\pi \le \theta \le \dfrac{3\pi}{2}$, what is the exact value of $\cot\theta$.

   x r

   $y = \sqrt{8} = 2\sqrt{2}$ $\dfrac{1}{2\sqrt{2}}$

6. Point $P(-4, -2)$ is on the terminal arm of an angle θ in standard position. What is the exact value of $\sec\theta$.

   -4 -2 $\sqrt{26}$
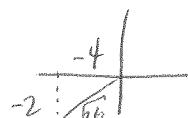
   $\sec\theta = \dfrac{\sqrt{20}}{-4} = \dfrac{2\sqrt{5}}{-4} = \dfrac{\sqrt{5}}{-2}$

7. The terminal arm of an angle θ in standard position passes through the point $P(-3, 4)$. Find the exact value of $\csc\theta + \tan\theta$.

   4 5 -3
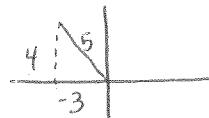
   $\dfrac{5}{4} + \dfrac{4}{-3} = -\dfrac{1}{12}$

8. If $\sin\theta = -\dfrac{3}{7}$ and $\tan\theta > 0$, find the values of the other trig ratios for θ.

   $\sqrt{40}$ 3 7

   $\tan\theta = \dfrac{3}{\sqrt{40}}$ $\cot\theta = \dfrac{\sqrt{40}}{3}$
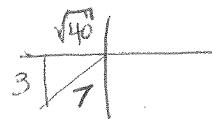
   $\sin\theta = -\dfrac{3}{7}$ $\csc\theta = -7/3$

   $\cos\theta = -\dfrac{\sqrt{40}}{7}$ $\sec\theta = -7/\sqrt{40}$

9. Given $\sec\theta = \dfrac{5}{2}$ and the terminal arm is in quadrant IV, find the exact values of $\csc\theta$ and $\cot\theta$.

   $\sec\theta = \dfrac{5}{2}$ 2 5 $\sqrt{21}$