

PRACTICE equivalent Expressions - Some Solutions to 6.4 #4, #8

not doing it, just in terms of related acute angle

4. State an equivalent expression in terms of the related acute angle.

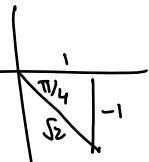
a) $\sin \frac{5\pi}{6}$

c) $\cot \left(-\frac{\pi}{4} \right)$

b) $\cos \frac{5\pi}{3}$

d) $\sec \frac{7\pi}{6}$

c) $\cot \left(-\frac{\pi}{4} \right) = \frac{x}{y} = \frac{1}{-1}$



$= \tan \left(-\frac{\pi}{4} \right)$ reciprocal of one is still one

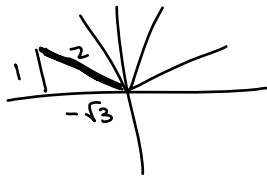
$= \tan \left(\frac{3\pi}{4} \right)$ tangent is neg in II and IV by symmetry

$= \cot \left(\frac{7\pi}{4} \right)$ adding 2π to angle (twice the period)

$= -\tan \left(\frac{\pi}{4} \right)$ tangent is odd

etc.

a) $\sin \frac{5\pi}{6}$
 $= \frac{y}{r} = \frac{1}{2}$

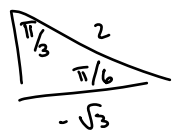


$= \sin \frac{\pi}{6}$

by symmetry sine is pos in I and II

$= \cos \frac{\pi}{3}$

by cofunction complementary angles



$= \sin \frac{17\pi}{6}$

adding period 2π

$= \cos \frac{\pi}{3}$

shift cosine $\frac{\pi}{2}$ to the right, same as

$= -\sin \left(-\frac{5\pi}{6} \right)$

since sine is odd etc!!

8. State an equivalent expression in terms of the related acute angle.

a) $\cos \frac{3\pi}{4}$

c) $\csc \left(-\frac{\pi}{3} \right)$

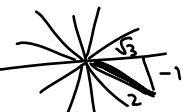
e) $\sin \frac{-\pi}{6}$

b) $\tan \frac{11\pi}{6}$

d) $\cot \frac{2\pi}{3}$

f) $\sec \frac{7\pi}{4}$

b) $\tan \frac{11\pi}{6} = \frac{y}{x} = \frac{-1}{\sqrt{3}}$



$= -\frac{\sqrt{3}}{3}$

$= \tan \left(\frac{5\pi}{6} \right)$

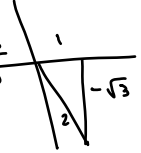
since tangent is neg in II and IV by symmetry

(also subtract period π will be the same)

$= -\cot \left(\frac{\pi}{3} \right)$

cotangent is a reflection of tangent and shift of $\frac{\pi}{2}$ any direction

c) $\csc \left(-\frac{\pi}{3} \right) = \frac{r}{y} = \frac{2}{-1} = -2$



$= \csc \left(\frac{5\pi}{3} \right)$

adding period 2π

$= -\csc \left(\frac{\pi}{3} \right)$

cosecant is odd

$= -\sec \left(\frac{\pi}{6} \right)$

cofunction or complementary

$= \csc \left(\frac{4\pi}{3} \right)$

sine is neg in III, IV by symmetry

etc...

