Thirteenth Set of Homework

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Due: Monday March 14

Please note: You should fully justify your answers.

Trigonometric numbers of arbitrary angles

1. Use the values of this table:

θ	$\sin\theta$	$\cos\theta$	$\tan\theta$	$\cot\theta$
$0°$	0	1	0	**und**
$30°$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$	$\sqrt{3}$
$45°$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1	1
$60°$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$	$\frac{\sqrt{3}}{3}$
$90°$	1	0	**und**	0

to complete the table below:

θ	$\sin\theta$	$\cos\theta$	$\tan\theta$	$\cot\theta$
$315°$				
$-780°$				
$150°$				
$240°$				
$650°$				
$-180°$				
$1800°$				
$210°$				

2. Refer to Figure 1. Given that $\cos\theta = \dfrac{1}{4}$ find the sine the cosine the tangent and the cotangent of the angles θ, θ', θ'' and θ'''

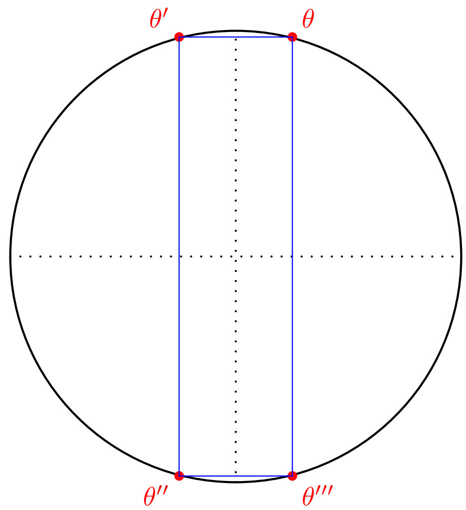

Figure 1: The arcs in Question 2

3. For the arc θ shown in Figure 2 we have that $\sin\theta = \dfrac{1}{3}$. Find an arc ϕ such that
   (a) $\cos\phi = \dfrac{2\sqrt{2}}{3}$ and $\sin\phi = -\dfrac{1}{3}$
   (b) $\cos\phi = -\dfrac{2\sqrt{2}}{3}$ and $\sin\phi = \dfrac{1}{3}$
   (c) $\cos\phi = -\dfrac{2\sqrt{2}}{3}$ and $\tan\phi = \dfrac{\sqrt{2}}{4}$

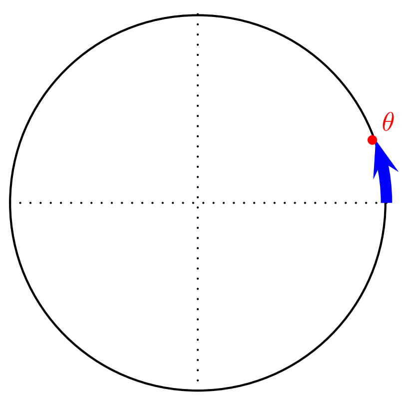

Figure 2: The arc of Question 3

4. Find the sine, cosine, tangent, and cotangent of an angle ϕ that
   (a) has $\sin\phi = .35$ and is in the first quadrant.
   (b) has $\cos\phi = .2$ and is in the fourth quadrant.
   (c) has $\sin\phi = \dfrac{\sqrt{5}}{5}$ and is in the second quadrant.
   (d) has $\sin\phi = -\dfrac{2}{3}$ and is in the third quadrant.

5. Use your calculator to find an angle θ with $0^\circ \leq \theta < 360^\circ$ such that

   (a) $\sin\theta = 0.544639$ and $\cos\theta < 0$

   (b) $\cos\theta = .3456$ and $\sin\theta < 0$

   (c) $\cos\theta = -0.6427876$ and $\tan\theta > 0$

   (d) $\cot\theta = -0.383864$, $\cos\theta > 0$, and $\sin\theta < 0$

   (e) $\cos\theta < 0$, $\sin\theta < 0$, and $\tan\theta = 1.428148$