radical maths

for independence
for confidence
for creativity
for insight

Circular functions 2

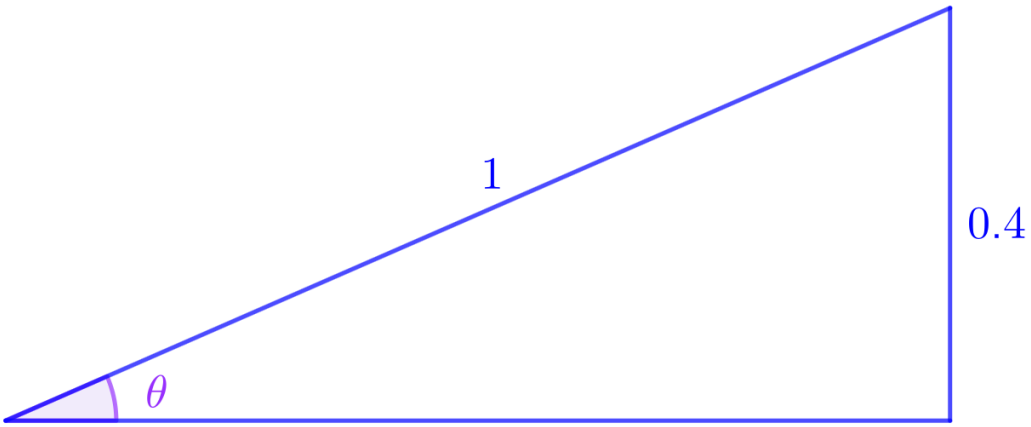
Solving circular functions equations

Circular functions

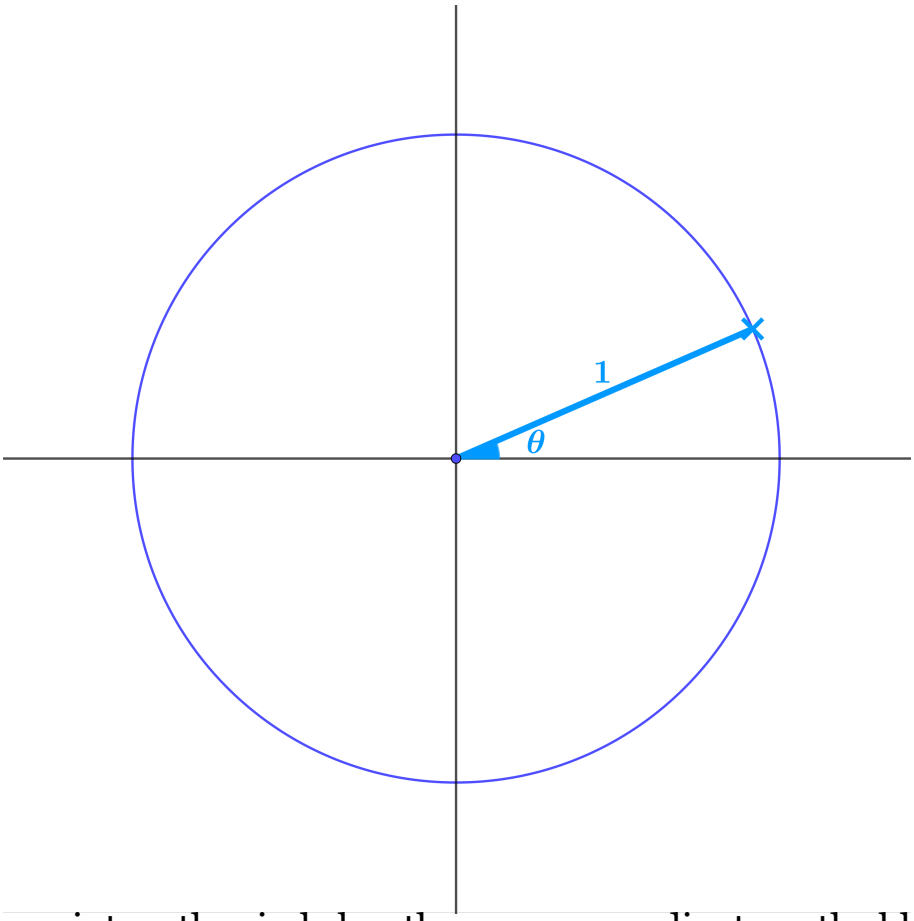
Defining the circular functions	sin, cos, tan and the unit circle
Solving circular function equations	**like $\sin\theta = 0.4$**
Graphing the circular functions	graphs $y = \cos x$ and the like
Relationships between circular functions	$\sin(90° - x) = \cos x$ and the like
More circular functions	$\sec x = \dfrac{1}{\cos x}$ and so on
Circular functions of sums	formulas like $\sin(A + B) = \sin A \cos B + \cos A \sin B$
Transforming and adding circular functions	$\sin x + \cos x = \sqrt{2}\sin\left(x + 45°\right)$ and so on
Differentiating circular functions	radians, and tangents to graphs
Integrating circular functions	areas
Inverses of circular functions	$\arcsin x$, $\cos^{-1} x$, $\cot^{-1} x$ and the like, including graphs, differentials, integrals, and integration by substitution

Solving equations with circular functions

Use your calculator to find the angle θ.

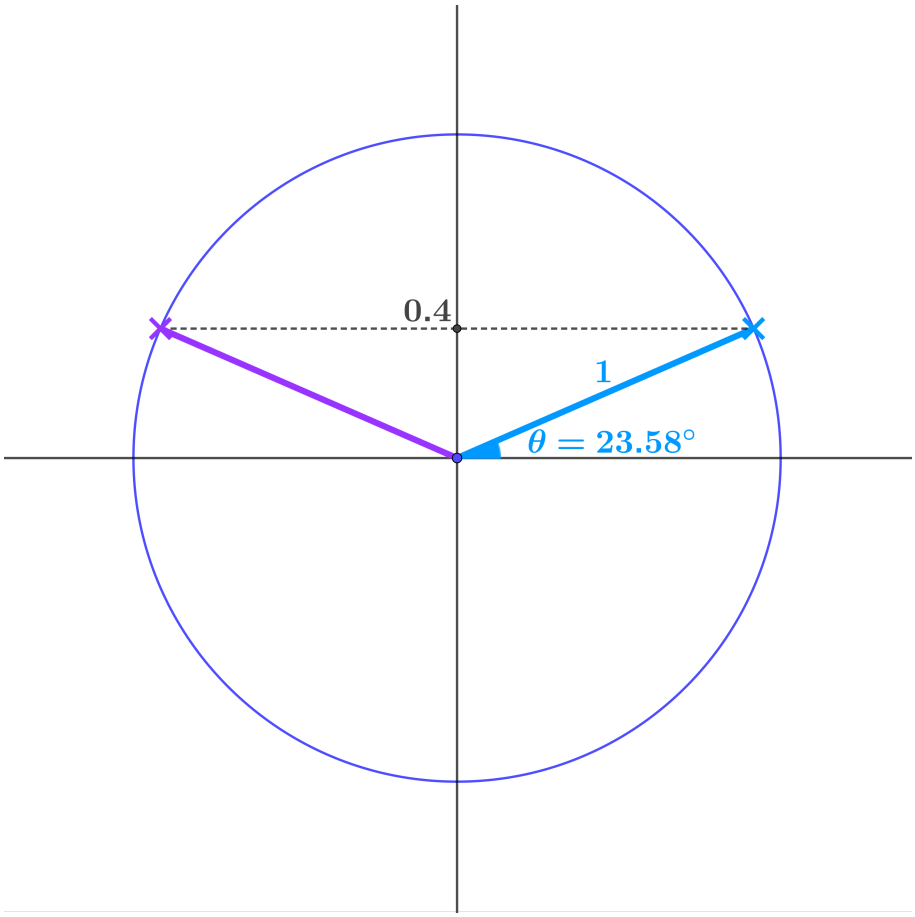


If the y coordinate of the blue point is 0.4, find the angle θ.

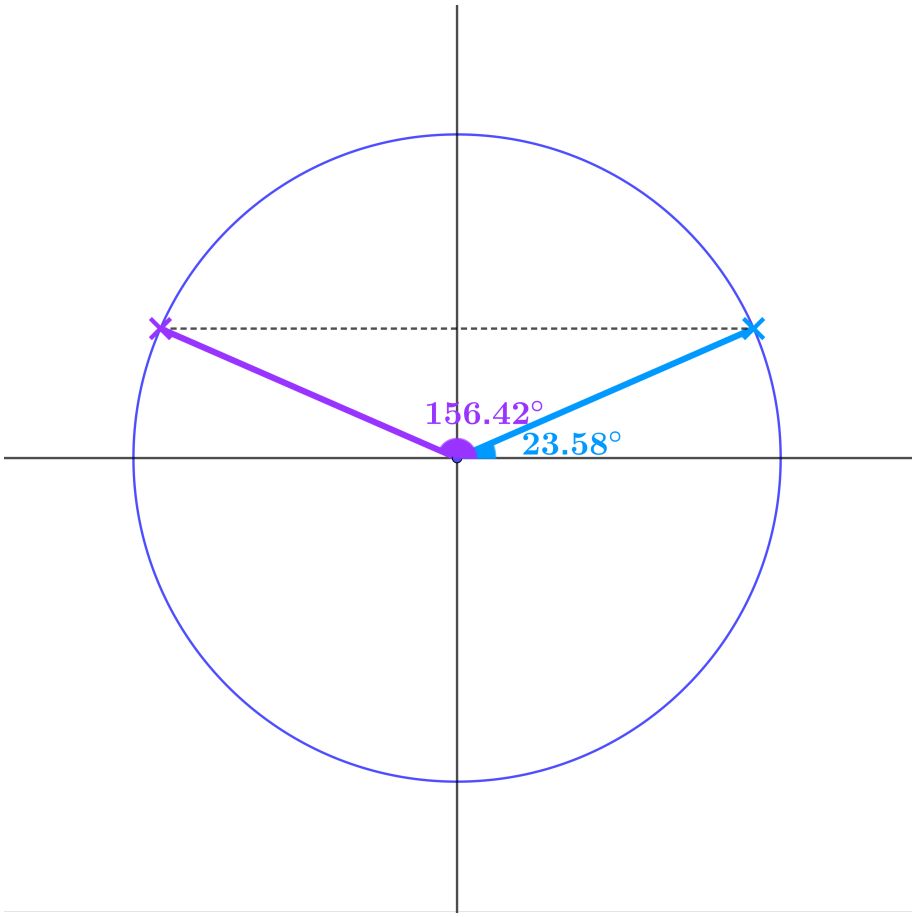


What other point on the circle has the same y coordinate as the blue point?

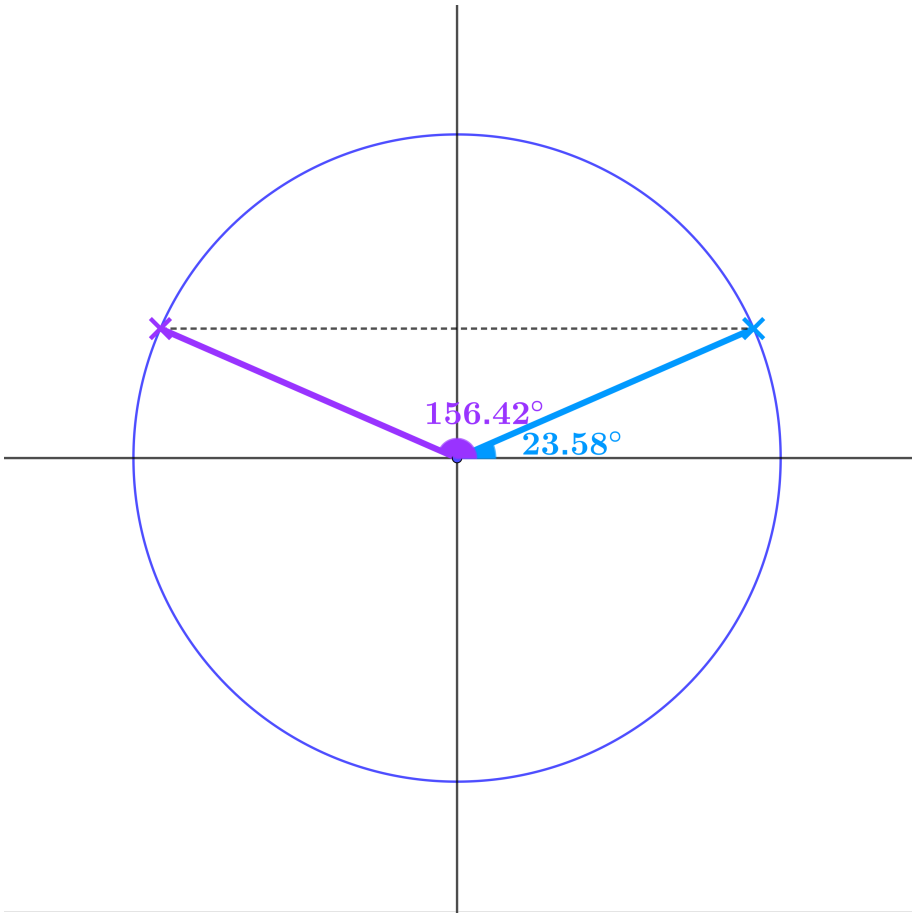
What other positive angle between $0°$ and $360°$ is a solution of $\sin\theta = 0.4$?



What negative angles between -360° and 0° are solutions of $\sin\theta = 0.4$?



Solve the equation $\sin\theta = 0.4$



If α is any solution of the equation $\sin\theta = k$, which of the following are also solutions of the equation:

$180 - \alpha$

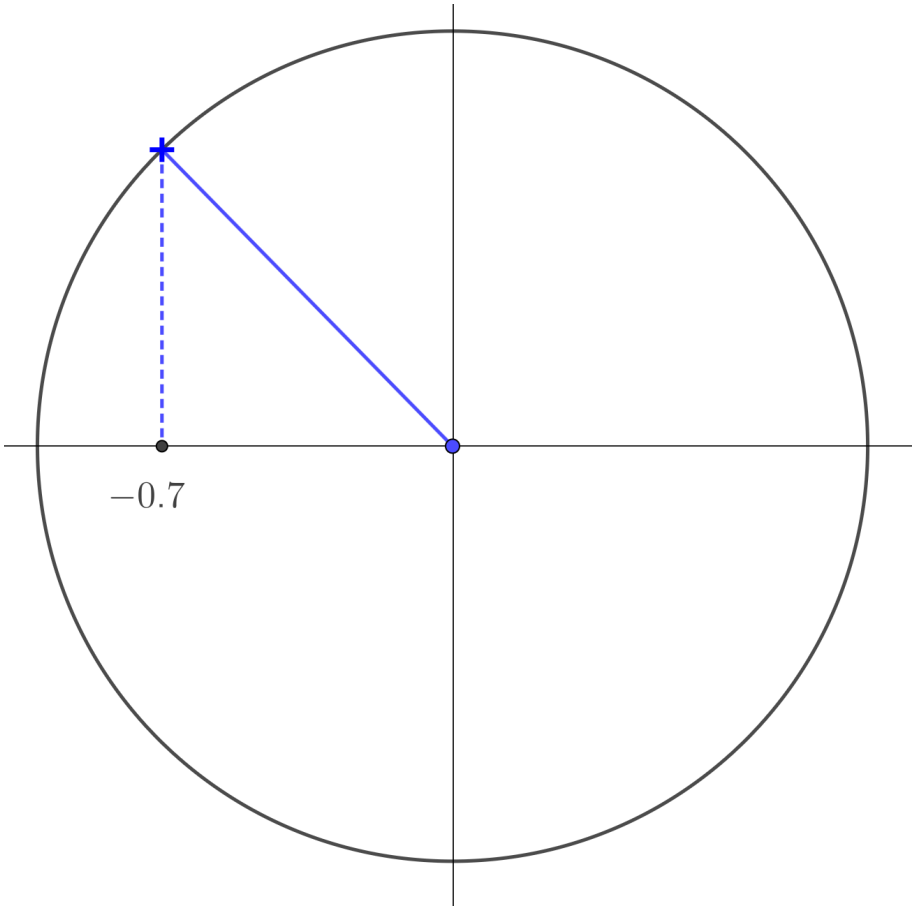
$180 + \alpha$

$-\alpha$

$\alpha + 360$

$\alpha - 360$

Adapt the previous method to solve the equation $\cos\theta = -0.7$.



If α is any solution of the equation $\cos\theta = k$, which of the following are also solutions of the equation:

$180 - \alpha$

$180 + \alpha$

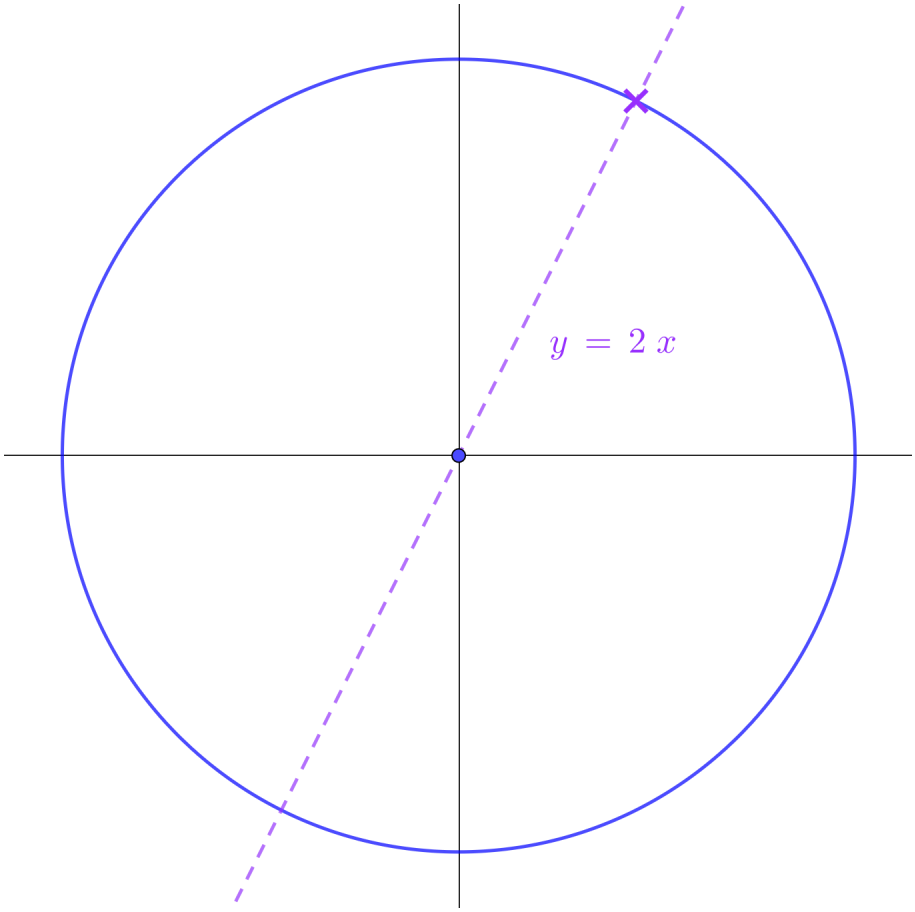
$-\alpha$

$\alpha + 360$

$\alpha - 360$

Use this diagram and a calculator to solve the equation

$$\tan\theta = 2$$



If α is any solution of the equation $\tan\theta = k$, which of the following are also solutions of the equation:

$180 - \alpha$

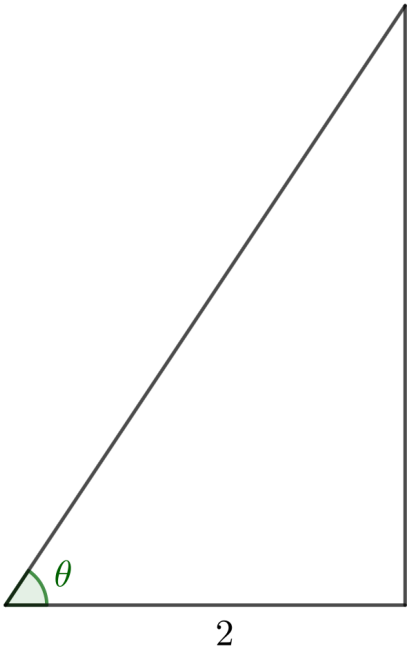
$180 + \alpha$

$-\alpha$

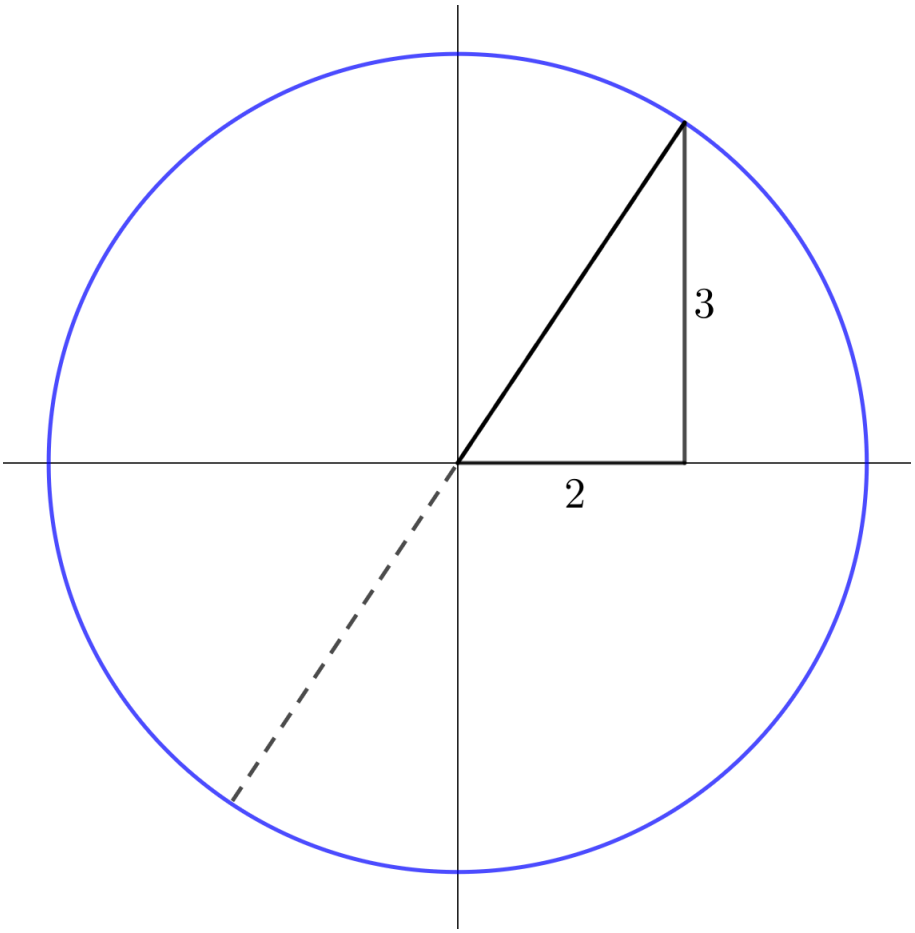
$\alpha + 360$

$\alpha - 360$

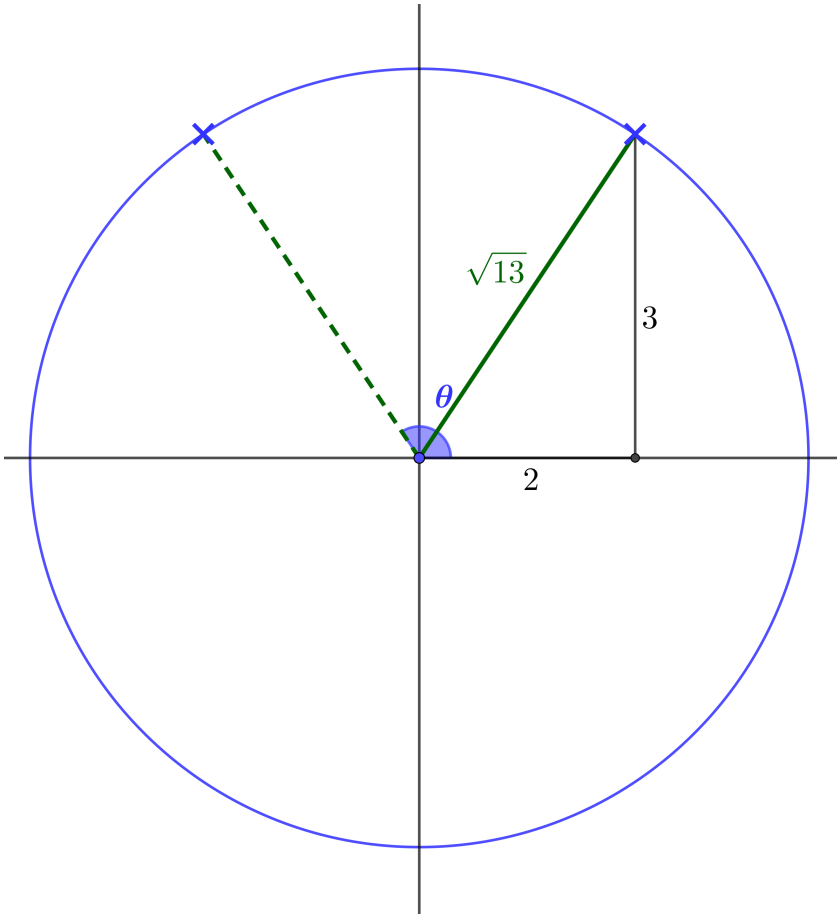
If $\tan\theta = \frac{3}{2}$, find $\sin\theta$ and $\cos\theta$.



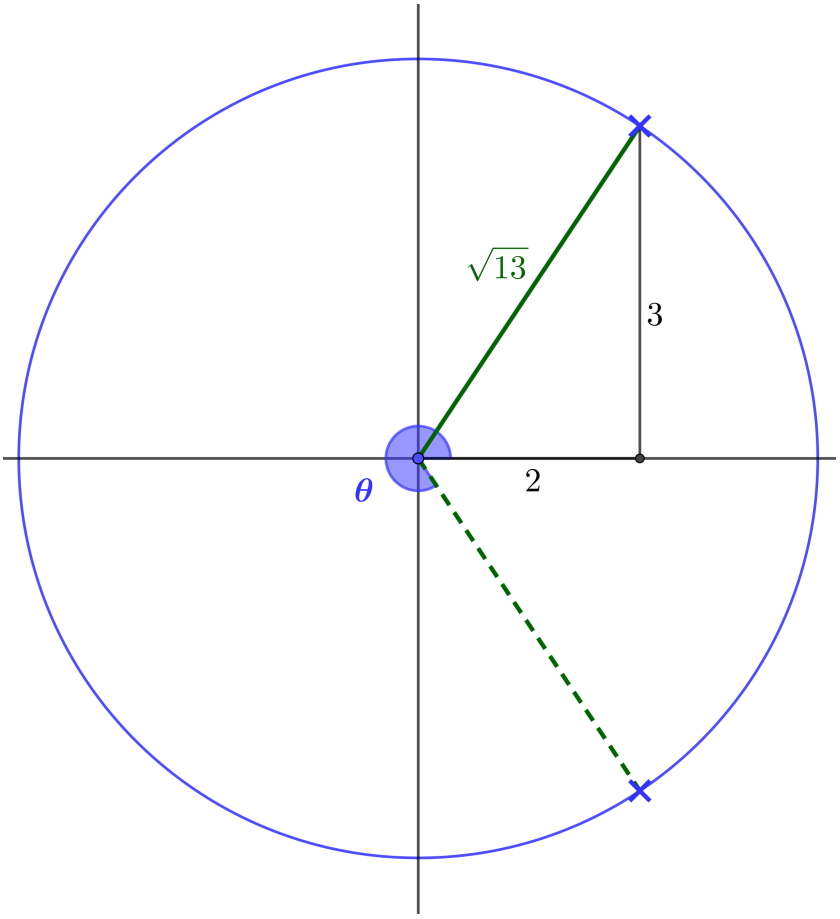
If $\tan\theta = \frac{3}{2}$, and θ is reflex, find $\sin\theta$ and $\cos\theta$.



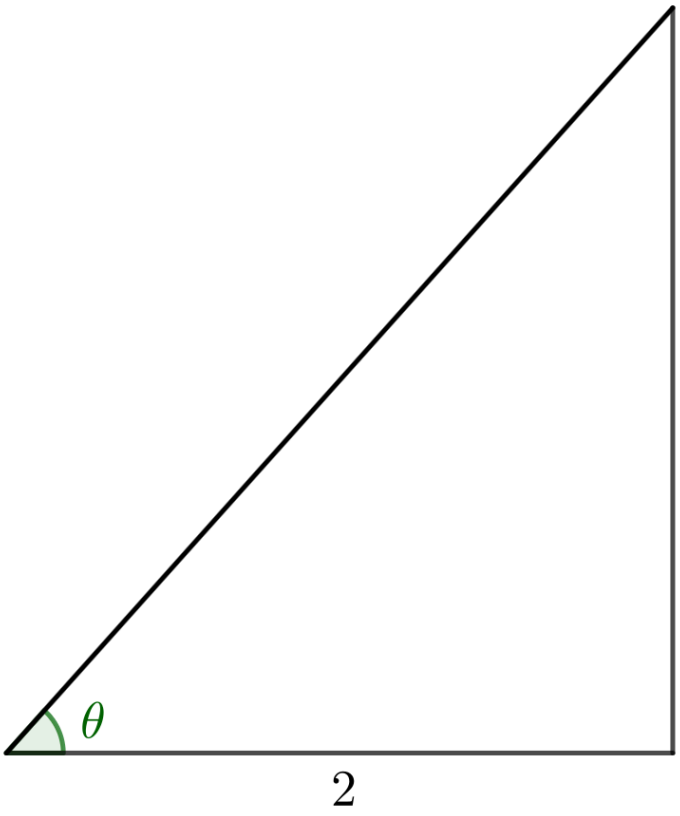
If $\tan\theta = -\frac{3}{2}$, and θ is obtuse, find $\sin\theta$ and $\cos\theta$.



If $\tan\theta = -\frac{3}{2}$, and θ is reflex, find $\sin\theta$ and $\cos\theta$.



If $\cos\theta = \frac{2}{3}$, find $\tan\theta$ and $\sin\theta$.



Find $\tan\theta$ and $\sin\theta$ when:

$\cos\theta = \frac{2}{3}$, and θ is between 270° and 360°

$\cos\theta = -\frac{2}{3}$, and θ is between 180° and 270°

$\cos\theta = -\frac{2}{3}$, and θ is obtuse.

Find $\tan\theta$ and $\cos\theta$ when $\sin\theta = \pm\frac{2}{3}$ for the various possible values of θ.