

Related Acute Angle

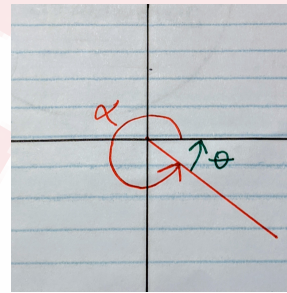
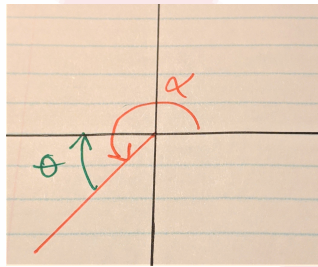
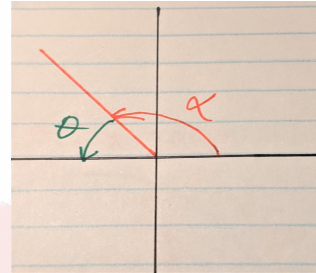
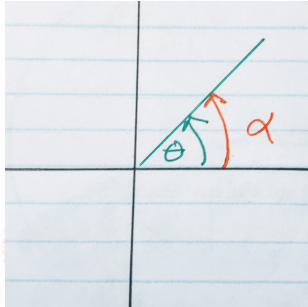
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2021

Related acute angle

The **related acute angle** is an angle less than 90° that is found between the terminal arm and the x-axis when the terminal arm is in quadrant 2, 3 or 4. In the figures below, the green angle θ is the *related acute angle* to the red angle α .



Example

For the following angles determine the related acute angle,

a) 142°

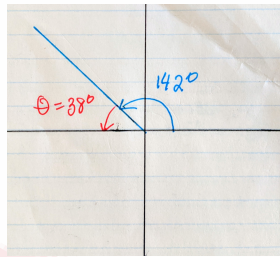
b) 225°

Solution:

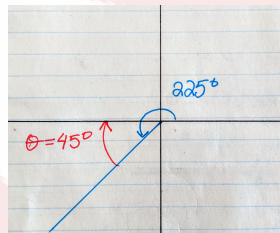
a) 142° is in quadrant 2. So the related acute angle is the positive

angle between the negative x-axis and the terminal arm. So,

$$\begin{aligned}\theta &= \text{related acute angle} \\ &= 180 - 142 \\ &= 38^\circ\end{aligned}$$

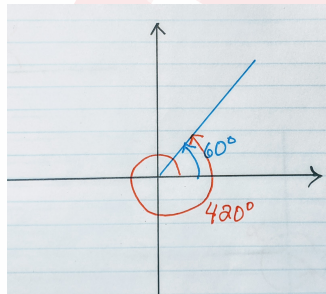


b) 225° is in the 3^{rd} quadrant. So the related acute angle is, $225 - 180 = 45^\circ$.



Coterminal angle

A **coterminal angle** is an angle measure that shares a terminal arm with another angle. In the figure below, the blue angle 60° is the given angle and the red angle 420° is the *coterminal angle* to the blue angle.

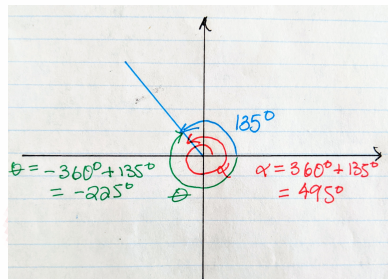


Example

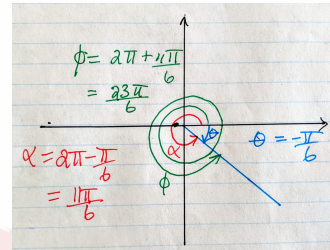
For the following angles determine at least 2 more coterminal angles.

a) 135°

b) $\frac{5\pi}{6}$ radians

Solution:

a)



b)

Exercises

For the following angles provide two more coterminal angles.

(a) 30°

(b) $\pi/12$ rad

(c) $13\pi/15$ rad

(d) 45°

(e) 120°

(f) $11\pi/8$ rad

(g) $5\pi/3$ rad

(h) 90°

(i) 115°

(j) $\pi/6$ rad