Trig 5.1

60 sec = 1 min
60 min = 1 deg

Convert angle measurements d/m/s and decimals
Find the number of degrees in a given number of rotations 360°
Identify coterminal angles
Identify reference angles x-axis

initial side

terminal side

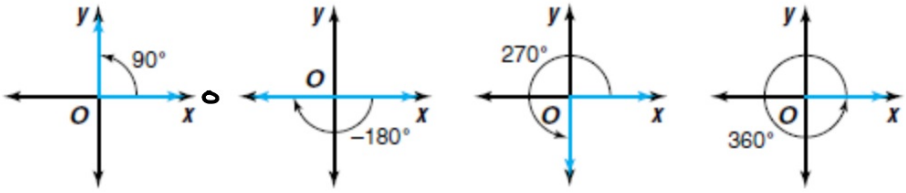
quadrantal angle

clockwise

counterclockwise

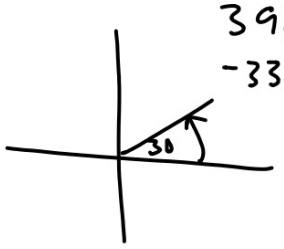
whiteboards

If the terminal side of an angle that is in standard position coincides with one of the axes, the angle is called a **quadrantal angle.** In the figures below, all of the angles are quadrantal.



Identify all angles that are coterminal with each angle. Then find one positive angle and one negative angle that are coterminal with each angle.

37. $30°$ **38.** $-45°$ **39.** $113°$ **40.** $217°$ **41.** $-199°$ **42.** $-305°$



390°
-330°

$360 + 30 = 390$
$720 + 30 = 750$
⋮
$360n + 30$

If each angle is in standard position, determine a coterminal angle that is between 0° and 360°. State the quadrant in which the terminal side lies.

45. $400°$ **46.** $-280°$ **47.** $940°$ **48.** $1059°$ **49.** $-624°$ **50.** $-989°$

$-360°$ $+360$

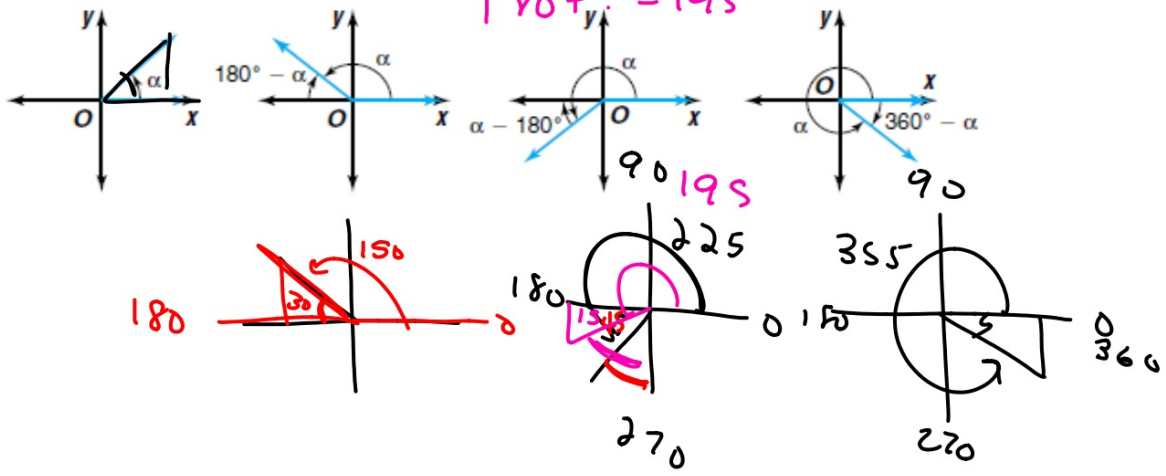
$40°$ $80°$

Q1 Q1

Reference angles (always go to x-axis)

180 + ? = 225

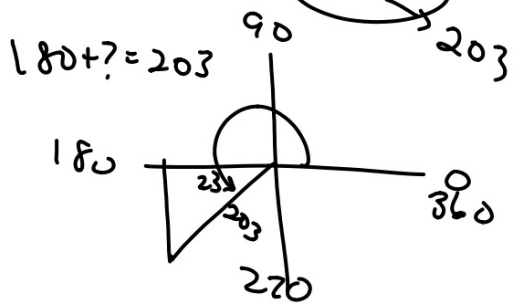
180 + ? = 195



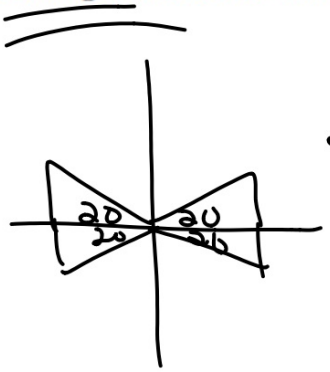
1. Sketch (quadrant)
2. Reference triangle
3. From x-axis

Find the measure of the reference angle for each angle.

52. $327°$ **53.** $148°$ **54.** $563°$ **55.** $-420°$ **56.** $-197°$ **57.** $1045°$



58. Name four angles between 0° and 360° with a reference angle of 20°.



20°
160°
200°
340°

Hint: look in all 4 quadrants

WB 5.1