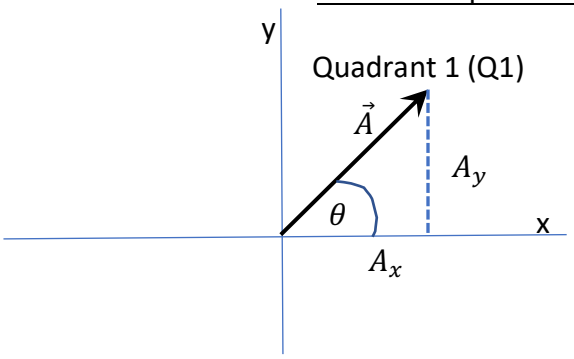
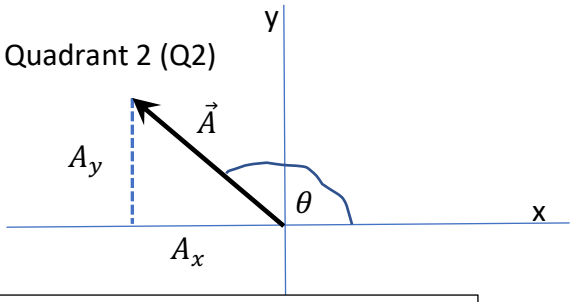
Vector Components in Two Dimensions (2D)

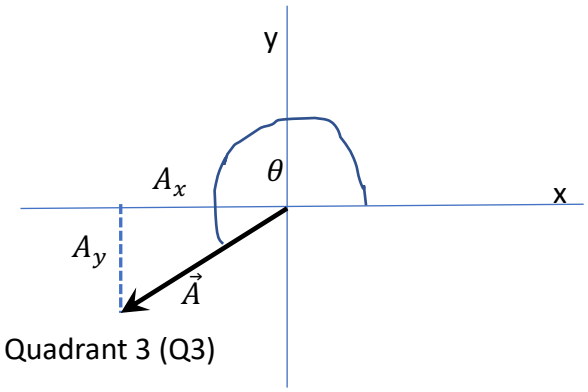


$0^\circ < \theta < 90^\circ$
$A_x = A\cos\theta > 0$
$A_y = A\sin\theta > 0$
Pythagorean theorem
Magnitude of $\vec{A}$, $A = \sqrt{A_x^2 + A_y^2}$
Example: $\vec{A} = A \text{ at } \theta = 2.0, at\ 30^\circ$,
$\vec{A} = (A_x, A_y) = (1.73, 1)$

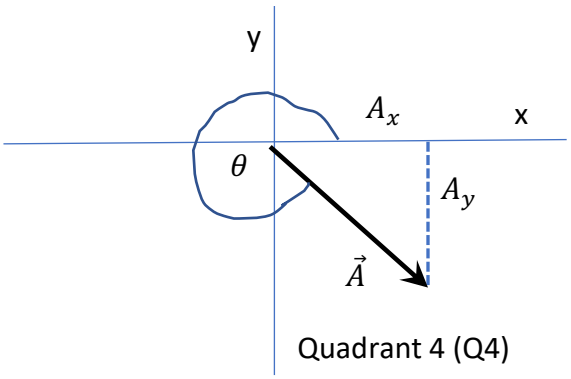


θ measured counterclockwise (CCW) with respect to (wrt) +x axis

$90^\circ < \theta < 180^\circ$
$A_x = A\cos\theta < 0$
$A_y = A\sin\theta > 0$
Pythagorean theorem
Magnitude of $\vec{A}$, $A = \sqrt{A_x^2 + A_y^2}$
Example: $\vec{A} = A \text{ at } \theta = 2.0, at\ 120^\circ$,
$\vec{A} = (A_x, A_y) = (-1, 1.73)$



$180^\circ < \theta < 270^\circ$
$A_x = A\cos\theta < 0$
$A_y = A\sin\theta < 0$
Pythagorean theorem
Magnitude of $\vec{A}$, $A = \sqrt{A_x^2 + A_y^2}$
Example: $\vec{A} = A \text{ at } \theta = 3.0, at\ 225^\circ$,
$\vec{A} = (A_x, A_y) = (-2.12, -2.12)$



$270^\circ < \theta < 360^\circ$
$A_x = A\cos\theta > 0$
$A_y = A\sin\theta < 0$
Pythagorean theorem
Magnitude of $\vec{A}$, $A = \sqrt{A_x^2 + A_y^2}$
Example: $\vec{A} = A \text{ at } \theta = 3.3, at\ 277^\circ$,
$\vec{A} = (A_x, A_y) = (0.4, -3.27)$