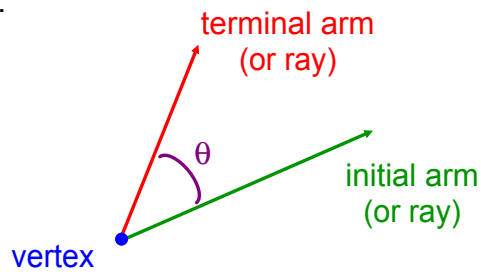


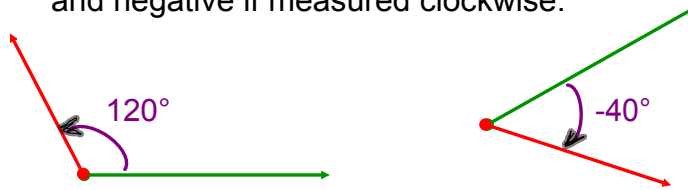
Angles in the Cartesian (x-y) Plane

Apr. 21/2011

Terminology:



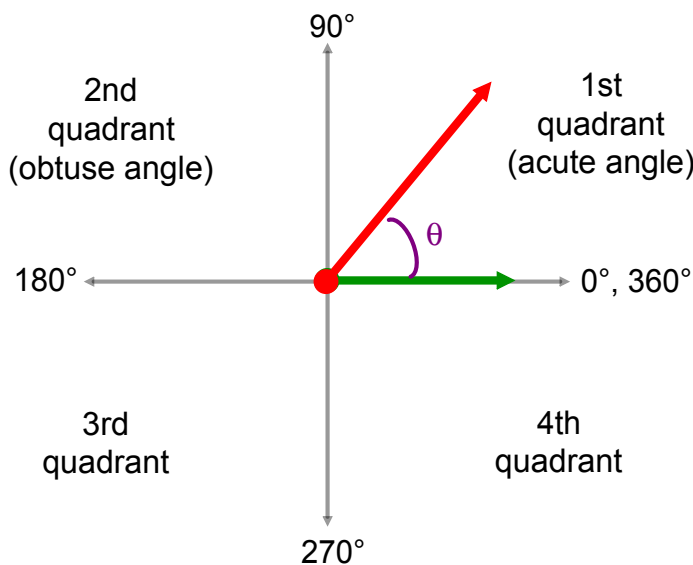
- an angle is positive if measured counter clockwise, and negative if measured clockwise.



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Definitions:

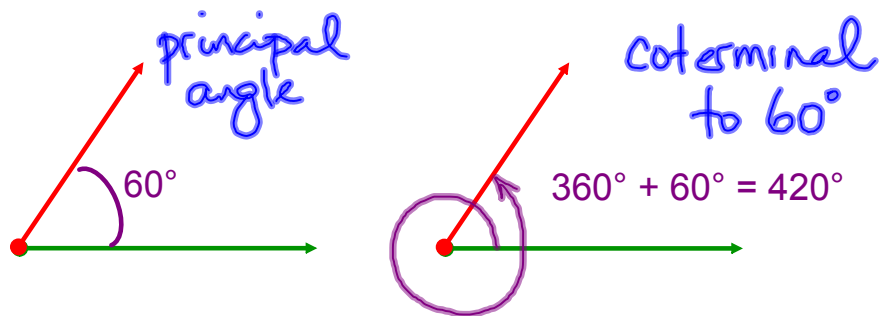
1. Standard Position - an angle is in standard position if the vertex is at the origin and the initial arm is on the positive x-axis



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2. Principal Angle - an angle between 0° and 360° .

3. Coterminal Angle(s) - angles that share the same initial and terminal arm.



4. Related Acute Angle / Reference Angle

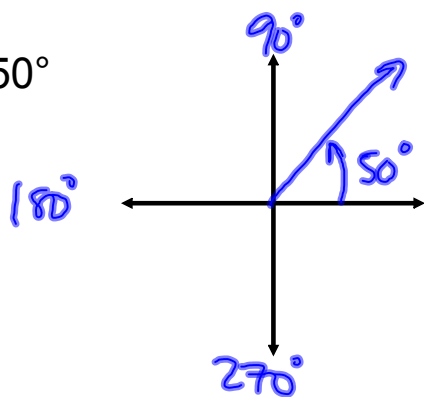
- an angle formed between the terminal arm and the (closest part of the) x-axis.

- always positive
- always acute ($0^\circ < \theta < 90^\circ$)

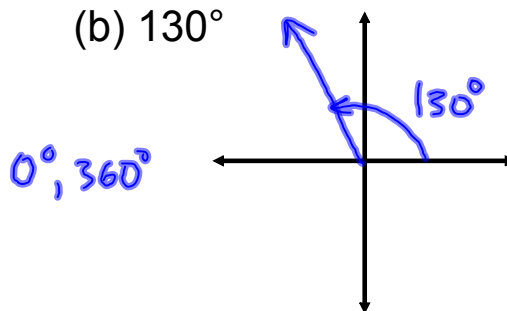
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Ex.1 Show the terminal arm for each angle:

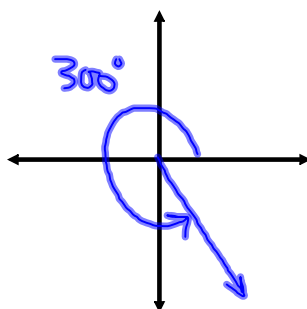
(a) 50°



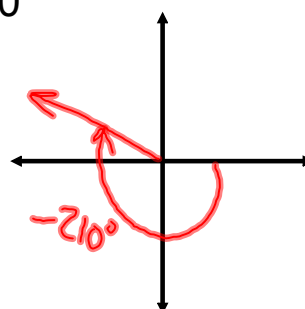
(b) 130°



(c) 300°



(d) -210°



Dec 10-10:43 PM

Ex.2 State the principal angle of:

$$\begin{array}{r} (a) \ 463^\circ \\ -360^\circ \\ \hline 103^\circ \end{array}$$

$$PA = 103^\circ$$

$$\begin{array}{r} (b) \ 940^\circ \\ -360^\circ \\ \hline 580^\circ \\ -360^\circ \\ \hline 220^\circ \end{array}$$

$$PA = 220^\circ$$

$$\begin{array}{r} (c) \ -387^\circ \\ +360^\circ \\ \hline -27^\circ \\ +360^\circ \\ \hline 333^\circ \end{array}$$

$$PA = 333^\circ$$

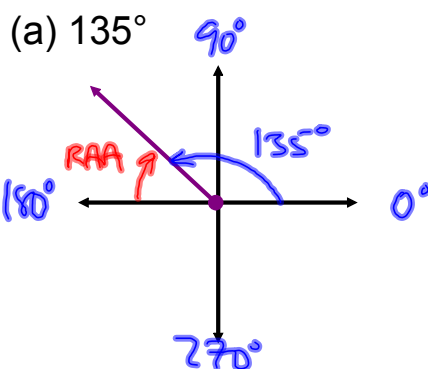
Ex.3 State 3 coterminal angles of:

$$\begin{array}{l} (a) \ 115^\circ + 360^\circ = 475^\circ \\ \quad \quad + 720^\circ = 835^\circ \\ \quad \quad - 360^\circ = -245^\circ \end{array}$$

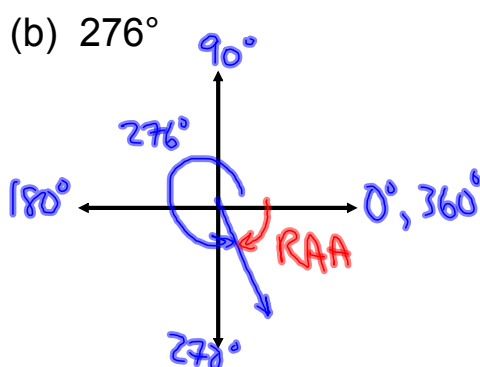
$$\begin{array}{l} (b) \ 28^\circ + 360^\circ = 388^\circ \\ \quad \quad + 720^\circ = 748^\circ \\ \quad \quad + 1080^\circ = 1108^\circ \end{array}$$

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Ex.4 Determine the reference angle (RAA) for:



$$\begin{aligned} RAA &= 180^\circ - 135^\circ \\ &= 45^\circ \end{aligned}$$

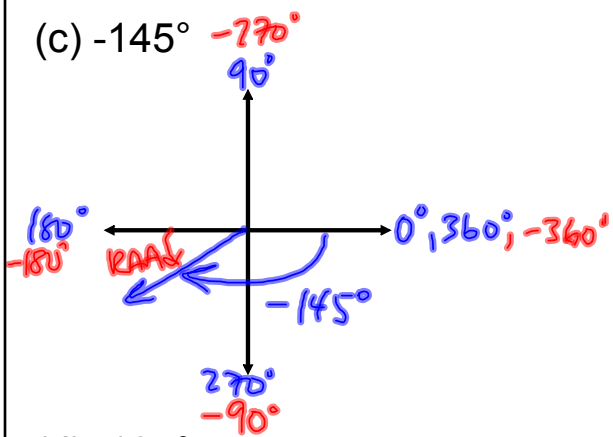


$$\begin{aligned} RAA &= 360^\circ - 276^\circ \\ &= 84^\circ \end{aligned}$$

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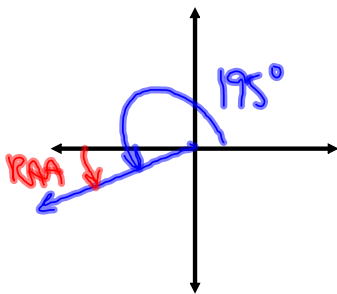
Ex.4 Determine the reference angle (RAA) for:

(c) -145°



$$\begin{aligned} \text{RAA} &= 180^\circ - 145^\circ \\ &= 35^\circ \end{aligned}$$

(d) 195°



$$\begin{aligned} \text{RAA} &= 195^\circ - 180^\circ \\ &= 15^\circ \end{aligned}$$

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Assigned Work:

(Handout) p.422 # 3 - 9 (odd), 11a

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