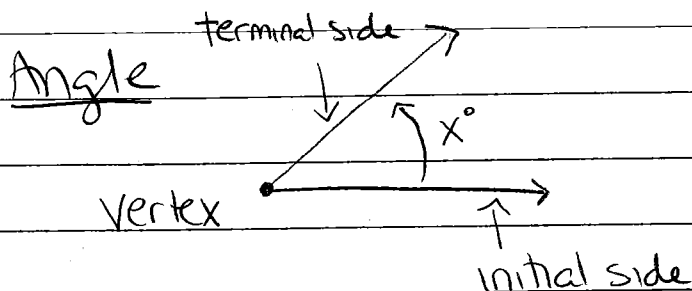


6.1 Angles and Their Measure

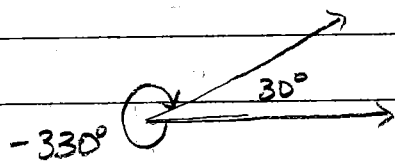
Area of Tate Garden - Due 1/14 (Review Day)

Trigonometry - measurement of triangles



initial side - starting position
terminal - ending position

Coterminal - angles with the same initial and terminal sides



30° and -330° are coterminal

positive angles - counterclockwise rotation

negative angles - clockwise rotation

standard position - angle with a vertex at the origin $(0,0)$ and initial side on the $+x$ -axis

Review

Quadrants

II

I

III

IV

Right: $= 90^\circ$

Straight: $= 180^\circ$

Acute: $0 < x < 90^\circ$

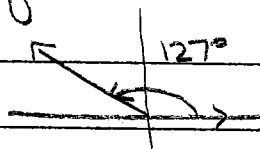
Obtuse: $90^\circ < x < 180^\circ$

Complementary - two positive angles whose sum is 90°

Supplementary - two positive angles whose sum is 180°

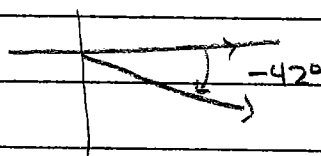
Example 1 Sketch each angle and determine the quadrant in which it lies

(A) 127°



Quad II

(B) -42°



Quad IV

Example 2 If possible, find the complement and supplement of each angle

(A) 27°

Complement: 63°

Supplement: 157°

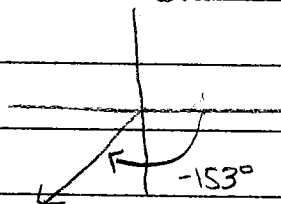
(B) 104°

Complement: DNE

Supplement: 76°

Example 3 Determine two coterminal angles

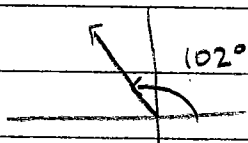
(A) -153°



Coterminal: 127°

-513°

(B) 102°

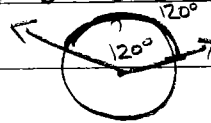


Coterminal: 462°

-258°

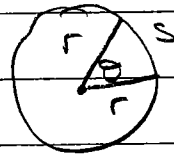
(6.1) cont'd

Central angle - angle whose vertex is the center of a circle



radian - measure of a central angle that intercepts arc (s) equal to the radius (r)

$$\theta = \frac{s}{r}$$



$$r = s$$

$$\text{Circumference} = 2\pi r$$

$$\text{Full rotation in radians} = 2\pi$$

$$360^\circ = 2\pi$$

Converting between degrees and radians

Degrees \rightarrow radians

$$\times \frac{\pi}{180^\circ}$$

Radians \rightarrow degrees

$$\times \frac{180}{\pi}$$

Example 4 convert to degrees/radians

* degrees will be marked with $^\circ$

radians do not have a label

(A) 220°

$$\frac{220 \cdot \pi}{180} = \frac{220\pi}{180}$$

$$= \boxed{\frac{11\pi}{9}}$$

(B) $\frac{2\pi}{3}$

$$\frac{2\pi}{3} \cdot \frac{180}{\pi} = \frac{360}{3}$$

$$= 120^\circ$$

* Discussion:

$$\pi = 180^\circ$$

$$\frac{2\pi}{3} = \frac{2}{3} \text{ of } 180^\circ$$

$$= 120^\circ$$

Complement - add up to $90^\circ \Rightarrow \frac{\pi}{2}$

Supplement - add up to $180^\circ \Rightarrow \pi$

Example 5 If possible, find the complement and supplement of the angle

(A) $\frac{5\pi}{7}$

Complement:

$$\frac{5\pi}{7} + x = \frac{\pi}{2}$$

$$x = \frac{\pi}{2} - \frac{5\pi}{7}$$

$$= \frac{7\pi}{14} - \frac{10\pi}{14}$$

$$= \frac{-3\pi}{14}$$

not possible

Supplement:

$$\frac{5\pi}{7} + x = \pi$$

$$x = \pi - \frac{5\pi}{7}$$

$$= \frac{7\pi}{7} - \frac{5\pi}{7}$$

$$= \boxed{\frac{2\pi}{7}}$$

Degrees - Minutes - Seconds

2nd Apps

\circ
DMS

Alpha \pm "