

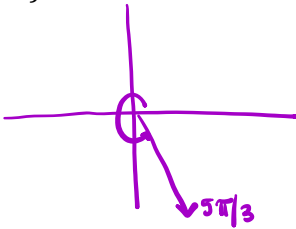
Problem Set 3.4

Key

1.) Sketch the following angles in standard position. Then convert the degree measures into radian measures.

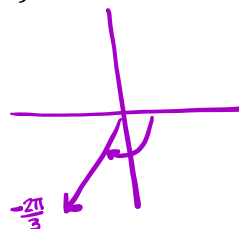
a) 300°

$$300 \cdot \frac{\pi}{180} = \frac{30\pi}{18} = \boxed{\frac{5\pi}{3}}$$



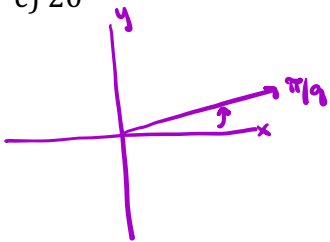
b) -120°

$$-120 \cdot \frac{\pi}{180} = \frac{-12\pi}{18} = \boxed{-\frac{2\pi}{3}}$$



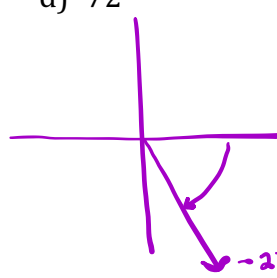
c) 20°

$$20 \cdot \frac{\pi}{180} = \frac{2\pi}{18} = \boxed{\frac{\pi}{9}}$$



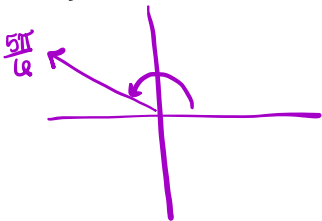
d) -72°

$$-72 \cdot \frac{\pi}{180} = \frac{-72\pi}{180} = \frac{-8\pi}{20} = \boxed{-\frac{2\pi}{5}}$$



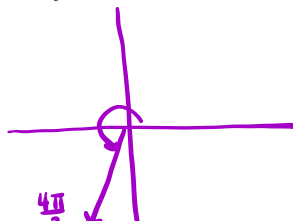
e) 150°

$$150 \cdot \frac{\pi}{180} = \frac{15\pi}{18} = \boxed{\frac{5\pi}{6}}$$



f) 240°

$$240 \cdot \frac{\pi}{180} = \frac{24\pi}{18} = \boxed{\frac{4\pi}{3}}$$

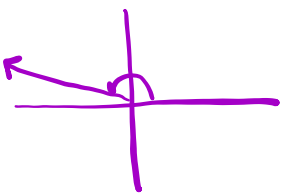


2.) Sketch the following angles in standard position. Then convert the radian measures into degree measures.

a) $\frac{8\pi}{9}$

$\frac{8}{9}$ of a π

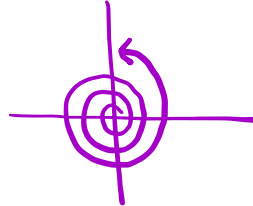
$$\frac{8\pi}{9} \cdot \frac{180}{\pi} = \boxed{160^\circ}$$



b) $\frac{13\pi}{2}$

$\frac{13}{2} = 6\frac{1}{2}$ of a π

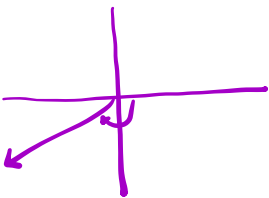
$$\frac{13\pi}{2} \cdot \frac{180}{\pi} = \boxed{1170^\circ}$$



c) $-\frac{5\pi}{6}$

$-\frac{5}{6}$ of a π

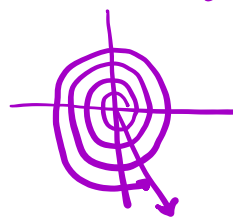
$$-\frac{5\pi}{6} \cdot \frac{180}{\pi} = \boxed{-150^\circ}$$



d) $\frac{23\pi}{3}$

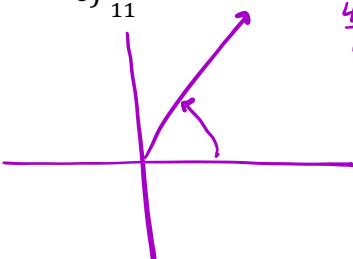
$\frac{23}{3} = 7\frac{2}{3}$ of a π or $7\frac{2}{3}$ of a π

$$\frac{23\pi}{3} \cdot \frac{180}{\pi} = \boxed{1380^\circ}$$



e) $\frac{4\pi}{11}$

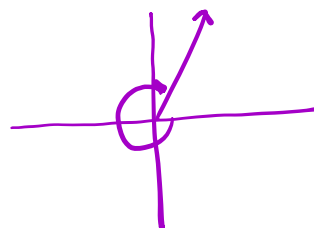
$$\frac{4\pi}{11} \cdot \frac{180}{\pi} = \boxed{65.5^\circ}$$



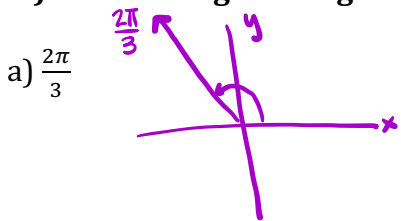
f) $-\frac{13\pi}{8}$

$-\frac{13}{8}$ of a π or $-1\frac{5}{8}$ of a π

$$-\frac{13\pi}{8} \cdot \frac{180}{\pi} = \boxed{-292.5^\circ}$$



3.) Sketch the given angle. Then give three coterminal angles (one must be negative).



$$\frac{2\pi}{3} + \frac{4\pi}{3} = \frac{8\pi}{3} + \frac{4\pi}{3} = \frac{14\pi}{3}$$

$$\frac{2\pi}{3} - \frac{4\pi}{3} = -\frac{4\pi}{3}$$

$$\frac{8\pi}{3}, \frac{14\pi}{3}, -\frac{4\pi}{3}$$

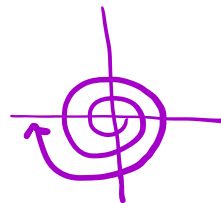


$$\frac{\pi}{8} + \frac{16\pi}{8} = \frac{17\pi}{8} + \frac{16\pi}{8} = \frac{33\pi}{8}$$

$$= -\frac{15\pi}{8}$$

$$\frac{17\pi}{8}, \frac{33\pi}{8}, -\frac{15\pi}{8}$$

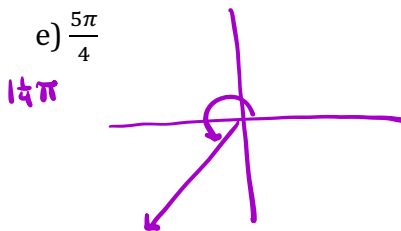
c) -5π



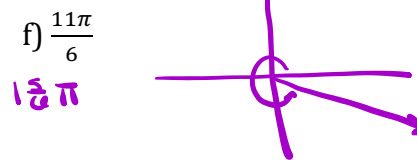
$$-3\pi, -\pi, \pi$$



$$\frac{5\pi}{9}, -\frac{31\pi}{9}, \frac{23\pi}{9}$$

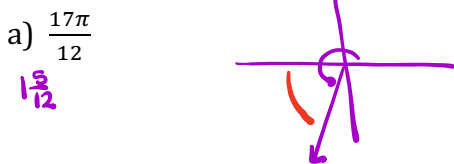


$$-\frac{3\pi}{4}, \frac{13\pi}{4}, \frac{21\pi}{4}$$

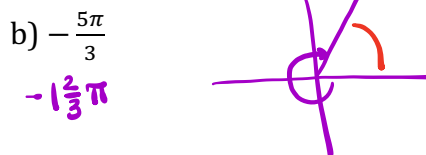


$$-\frac{\pi}{6}, \frac{23\pi}{6}, \frac{35\pi}{6}$$

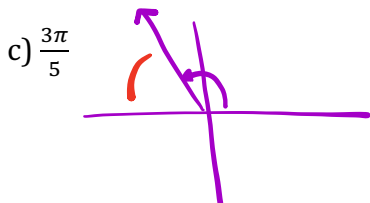
4.) Sketch the given angle. Then give its reference angle.



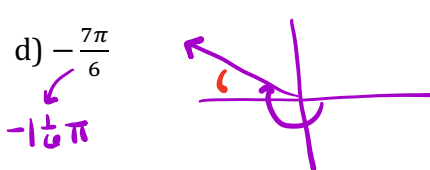
Reference Angle: $\frac{5\pi}{12}$



Reference Angle: $\frac{\pi}{3}$



Reference Angle: $\frac{2\pi}{5}$



Reference Angle: $\frac{\pi}{6}$

