**Topic**: Reference angles

**Question**: What is the reference angle of $37\pi/5$?

**Answer choices**:

A $\frac{\pi}{5}$

B $\frac{2\pi}{5}$

C $\frac{3\pi}{5}$

D $\frac{4\pi}{5}$

**Solution**: B

The angle $\theta = 37\pi/5$ is three full rotations of $2\pi$ in the positive direction, and then an extra $7\pi/5$ in the positive direction, which means the angle is coterminal with $\theta = 7\pi/5$.

The angle $\theta = 7\pi/5$ is in the third quadrant, so the reference angle $\beta$ is

$$\beta = \theta - \pi$$

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

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

$$\beta = \frac{2\pi}{5}$$

**Topic**: Reference angles

**Question**: Which angle is a reference angle for $1{,}180°$?

**Answer choices**:

A $10°$

B $80°$

C $100°$

D $260°$

**Solution**: B

The angle $\theta = 1{,}180^\circ$ is three full rotations of $360^\circ$, plus an extra $100^\circ$ in the positive direction, which means the angle is coterminal with $\theta = 100^\circ$.

So the angle $\theta = 1{,}180^\circ$ is coterminal with $\theta = 100^\circ$. Now that we have a positive coterminal angle, we can find the reference angle.

Since $\theta = 100^\circ$ is in the second quadrant, the reference angle $\beta$ is

$$\beta = 180^\circ - \theta$$

$$\beta = 180^\circ - 100^\circ$$

$$\beta = 80^\circ$$

**Topic**: Reference angles

**Question**: What is the reference angle of $-\pi/4$?

**Answer choices**:

A $-\frac{\pi}{4}$

B $\frac{5\pi}{4}$

C $\frac{9\pi}{4}$

D $\frac{\pi}{4}$

**Solution**: D

We want to convert this to a positive angle, which we can do by adding the negative angle to $2\pi$.

$$\theta = -\frac{\pi}{4} + 2\pi$$

$$\theta = -\frac{\pi}{4} + \frac{8\pi}{4}$$

$$\theta = \frac{7\pi}{4}$$

So the angle $\theta = -\pi/4$ is coterminal with $\theta = 7\pi/4$. Now that we have a positive coterminal angle, we can find the reference angle.

Since $\theta = 7\pi/4$ is in the fourth quadrant, the reference angle $\beta$ is

$$\beta = 2\pi - \theta$$

$$\beta = 2\pi - \frac{7\pi}{4}$$

$$\beta = \frac{8\pi}{4} - \frac{7\pi}{4}$$

$$\beta = \frac{\pi}{4}$$