

Show that $\sin 100 - \sin 10$ is positive.

Solution:

$$\sin 100 - \sin 10 = 2 \sin \frac{100 - 10}{2} \cos \frac{100 + 10}{2} = 2 \sin 45 \cos 55$$

$$14\pi < 14 \cdot 3,15 = 44,1 \Rightarrow 45 > 14\pi$$

$$15\pi > 15 \cdot 3,14 = 47,1 \Rightarrow 45 < 15\pi$$

Thus:

$$45 \in (14\pi ; 15\pi) \Rightarrow \sin 45 > 0.$$

$$17,5\pi < 17,5 \cdot 3,142 = 54,985 \Rightarrow 55 > 17,5\pi$$

$$18\pi > 18 \cdot 3,14 = 56,52 \Rightarrow 55 < 18\pi$$

Thus:

$$55 \in (17,5\pi ; 18\pi) \Rightarrow \cos 55 > 0$$

Since $\sin 45 > 0$ and $\cos 55 > 0$, then $\sin 100 - \sin 10$ is also positive, because $\sin 100 - \sin 10 = 2 \sin 45 \cos 55$.

Answer: $\sin 100 - \sin 10$ is positive.