

Task. Let $\sin m = 0.11$. Which of the following is $\sin(m/2)$?

- A. 0.79
- B. 0.78
- C. 0.77
- D. 0.05

Solution. Notice that

$$\cos m = \sqrt{1 - \sin^2 m} = \sqrt{1 - 0.11^2} = \sqrt{0.9879} \approx 0.99393$$

and

$$\cos^2(m/2) = \frac{1 + \cos m}{2} = \frac{1 + 0.99393}{2} = 0.996965.$$

Therefore

$$\sin(m/2) = \sqrt{1 - \cos^2(m/2)} = \sqrt{1 - 0.996965} = \sqrt{0.003035} \approx 0.05.$$

Thus the answer is D. 0.05