

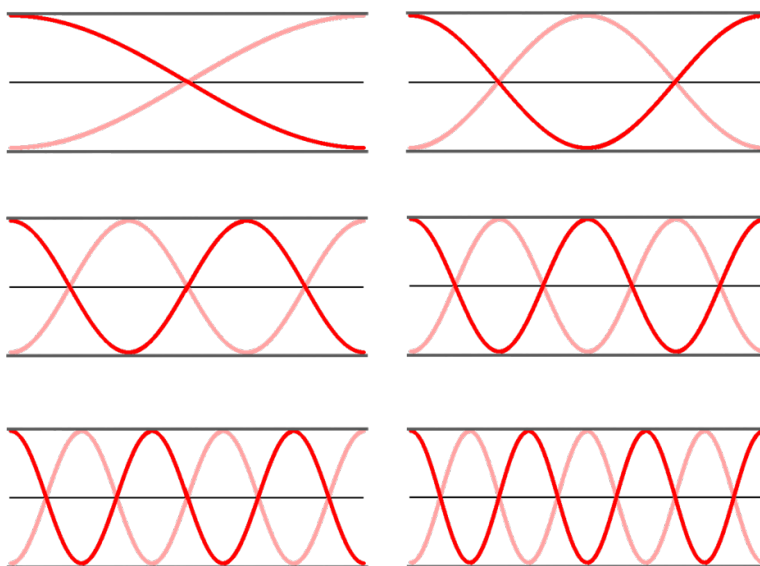
Name That Harmonic – Open-End Air Columns

Activity 1: ID the Pattern

Question Group 1

Question 1

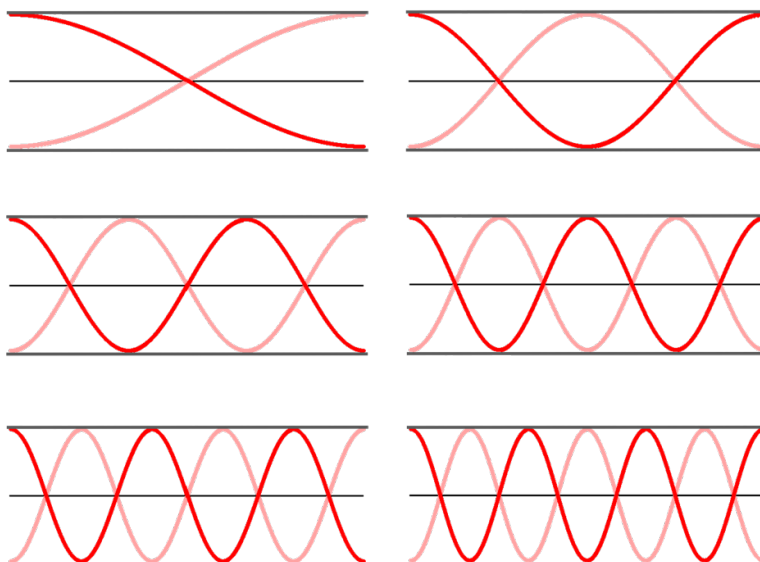
Identify the standing wave pattern for an open-end air column that is vibrating with a first harmonic wave pattern.



Question Group 2

Question 2

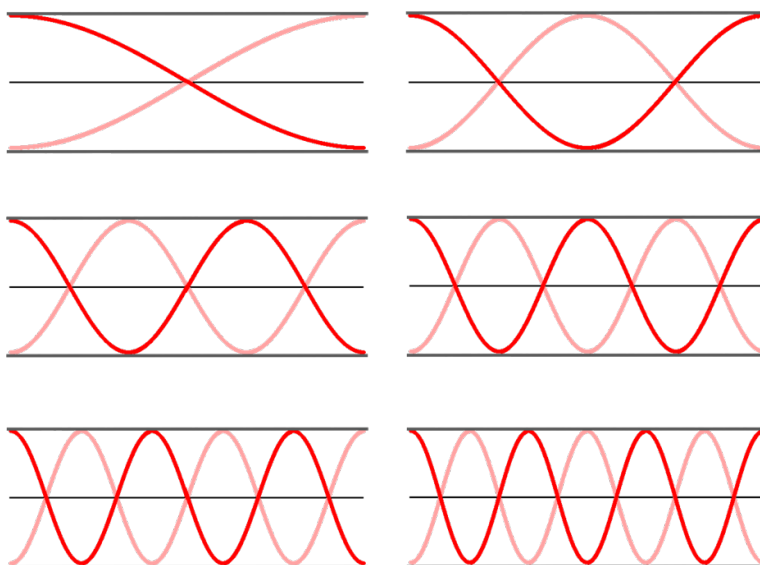
Identify the standing wave pattern for an open-end air column that is vibrating with a second harmonic wave pattern.



Question Group 3

Question 3

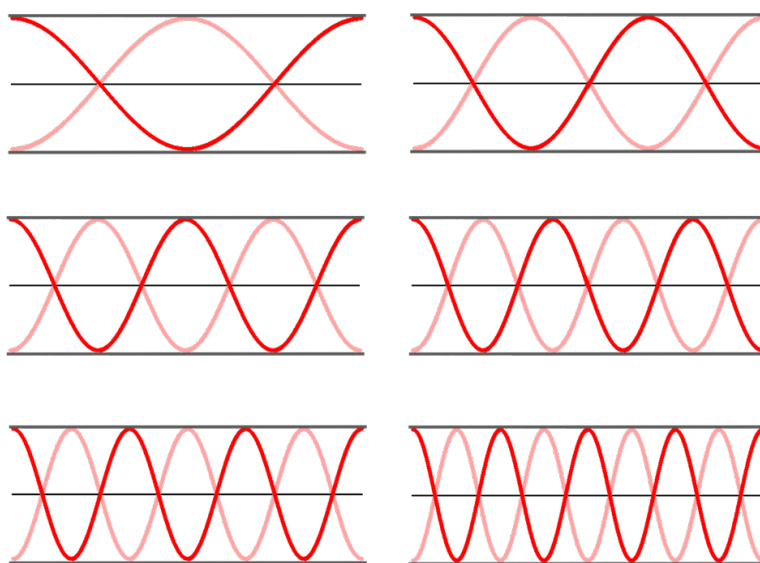
Identify the standing wave pattern for an open-end air column that is vibrating with a third harmonic wave pattern.



Question Group 4

Question 4

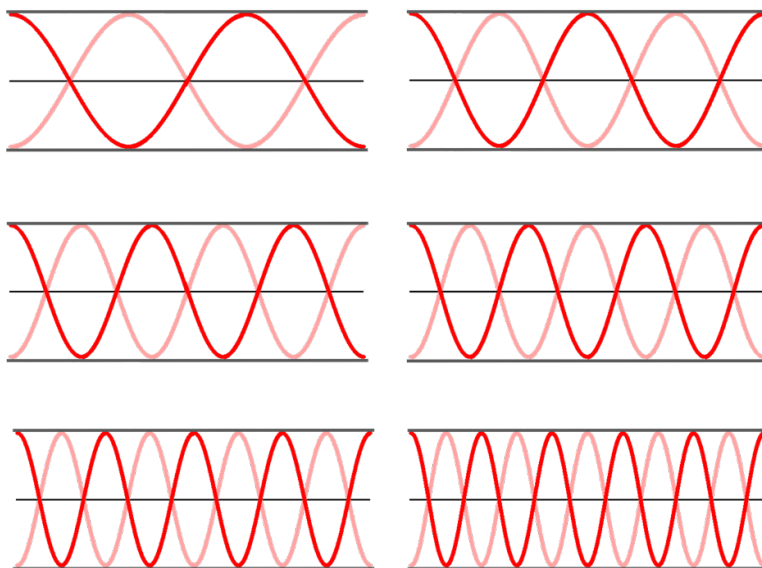
Identify the standing wave pattern for an open-end air column that is vibrating with a fourth harmonic wave pattern.



Question Group 5

Question 5

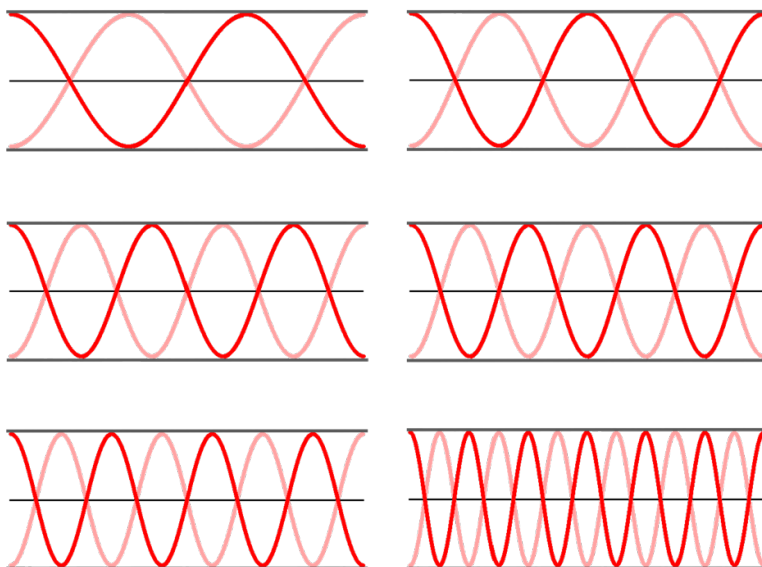
Identify the standing wave pattern for an open-end air column that is vibrating with a fifth harmonic wave pattern.



Question Group 6

Question 6

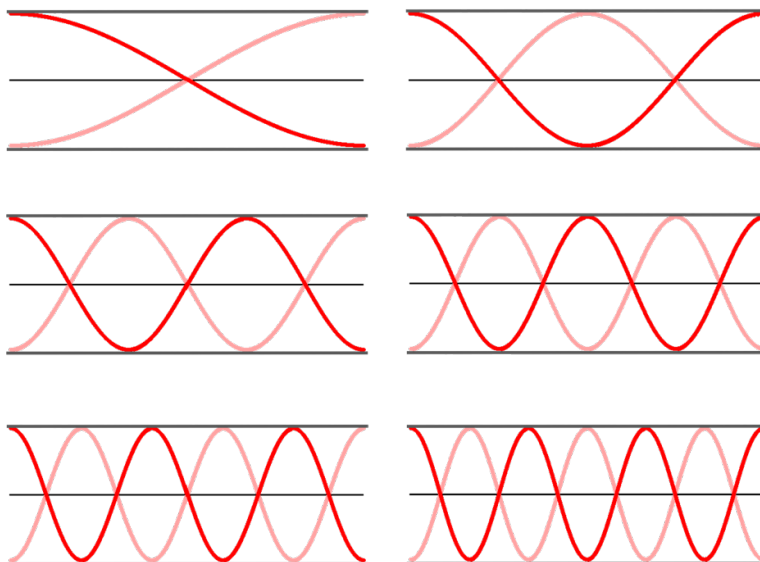
Identify the standing wave pattern for an open-end air column that is vibrating with a sixth harmonic wave pattern.



Question Group 7

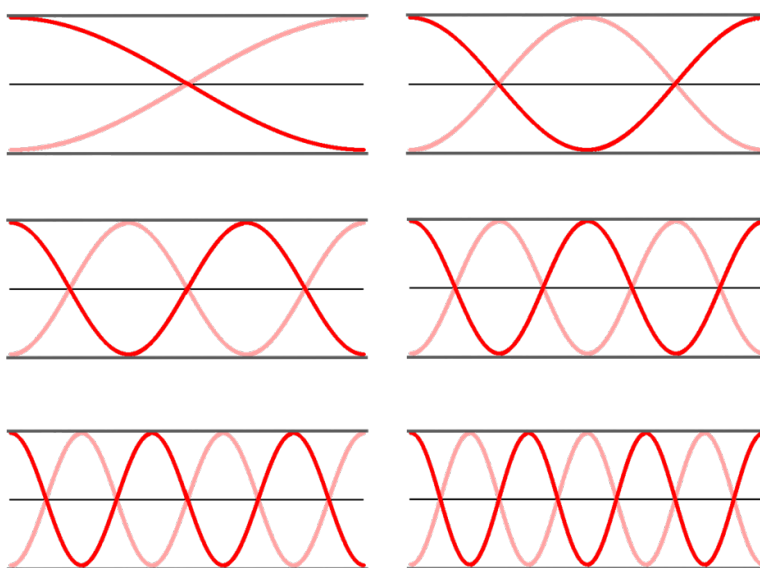
Question 7

The fundamental or first harmonic frequency of an open-end air column is 80 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 160 Hz.



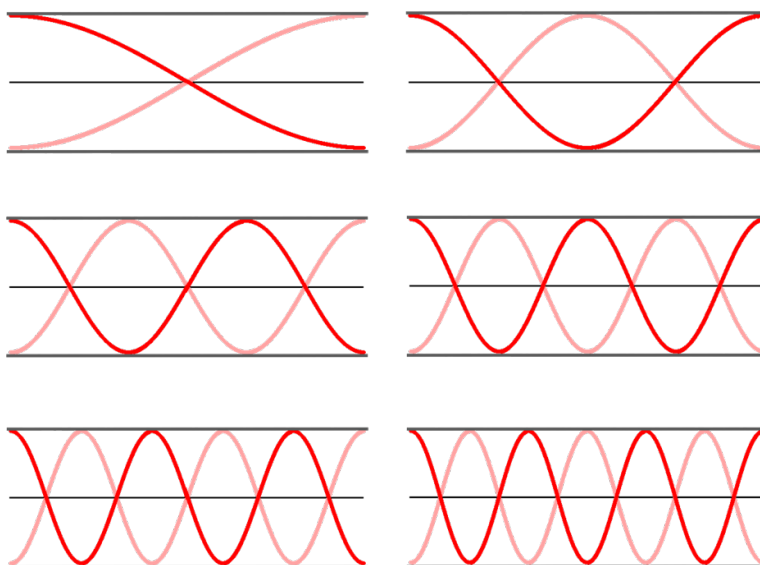
Question 8

The fundamental or first harmonic frequency of an open-end air column is 60 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 120 Hz.

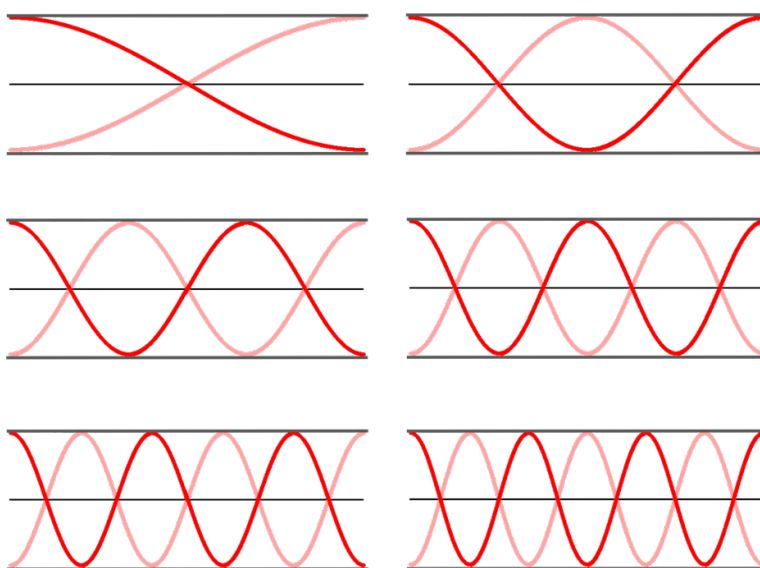


Question 9

The fundamental or first harmonic frequency of an open-end air column is 120 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 240 Hz.

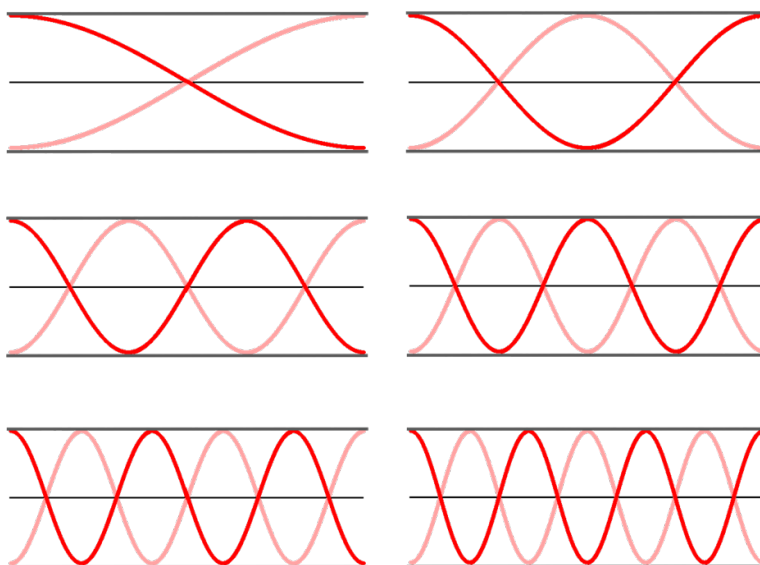
**Question Group 8****Question 10**

The fundamental or first harmonic frequency of an open-end air column is 80 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 240 Hz.

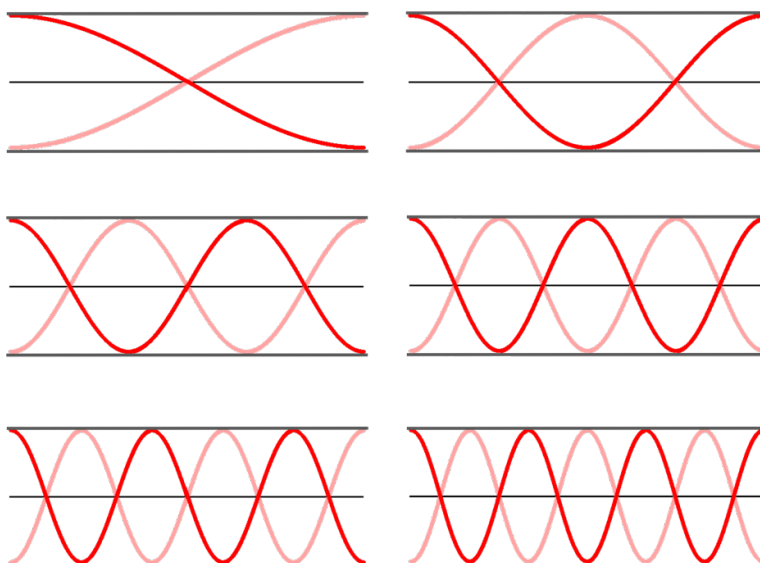


Question 11

The fundamental or first harmonic frequency of an open-end air column is 60 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 180 Hz.

**Question 12**

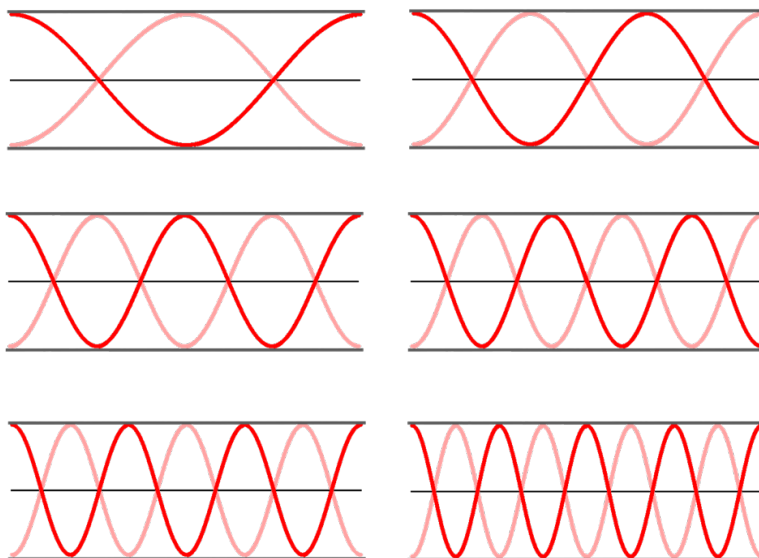
The fundamental or first harmonic frequency of an open-end air column is 120 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 360 Hz.



Question Group 9

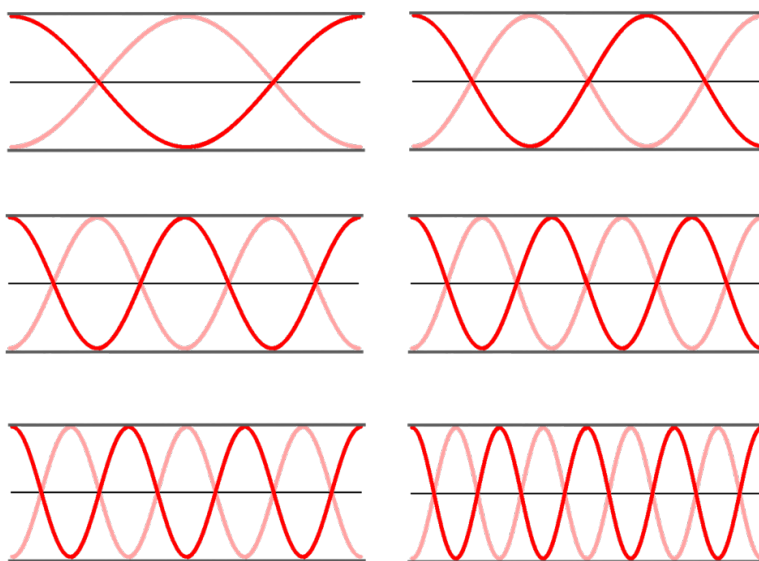
Question 13

The fundamental or first harmonic frequency of an open-end air column is 80 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 320 Hz.



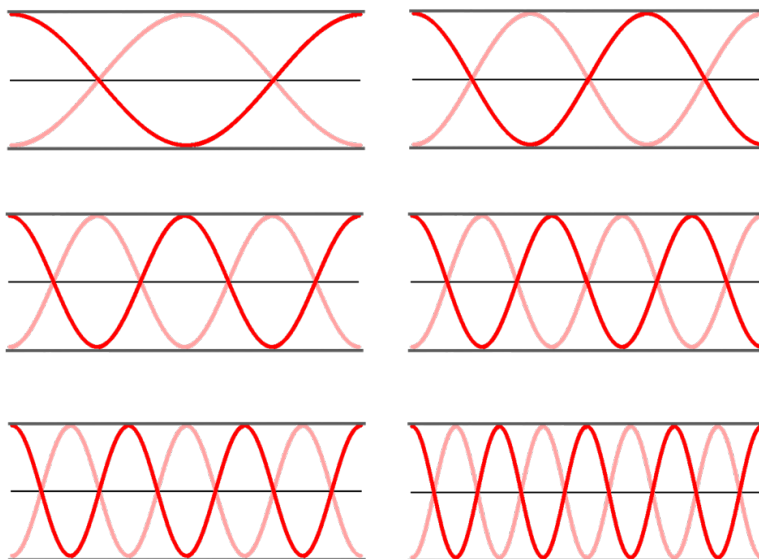
Question 14

The fundamental or first harmonic frequency of an open-end air column is 60 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 240 Hz.

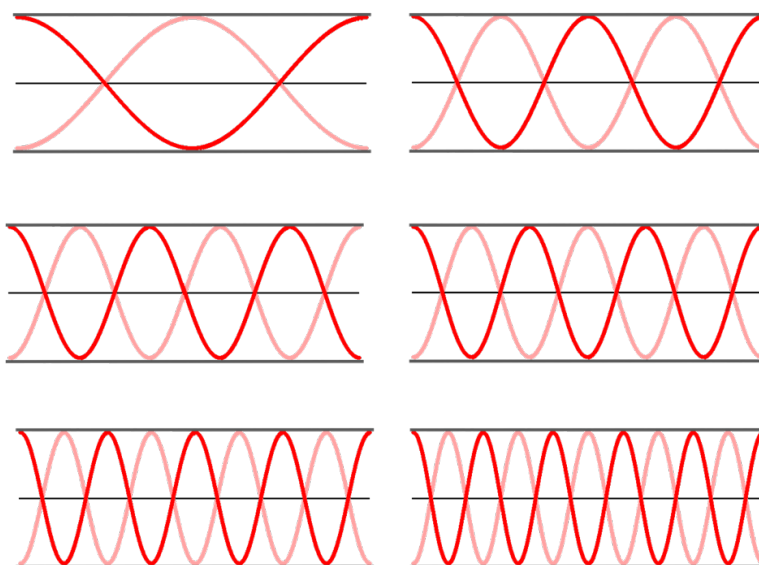


Question 15

The fundamental or first harmonic frequency of an open-end air column is 120 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 480 Hz.

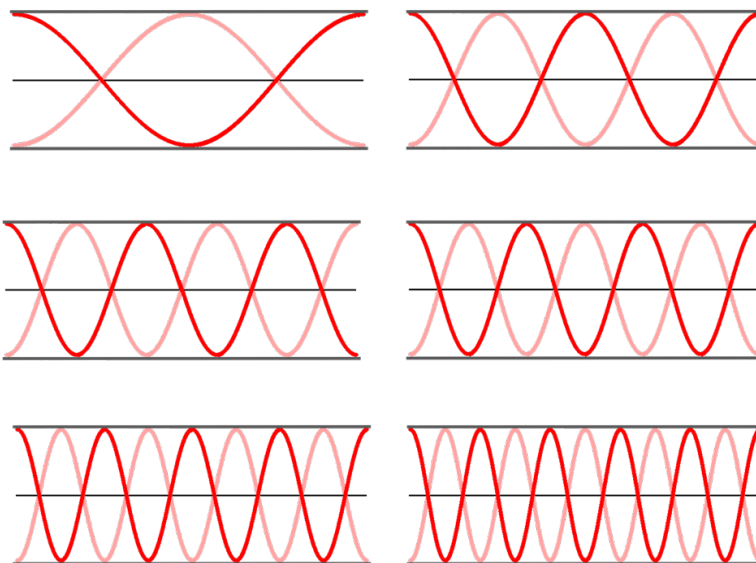
**Question Group 10****Question 16**

The fundamental or first harmonic frequency of an open-end air column is 80 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 400 Hz.

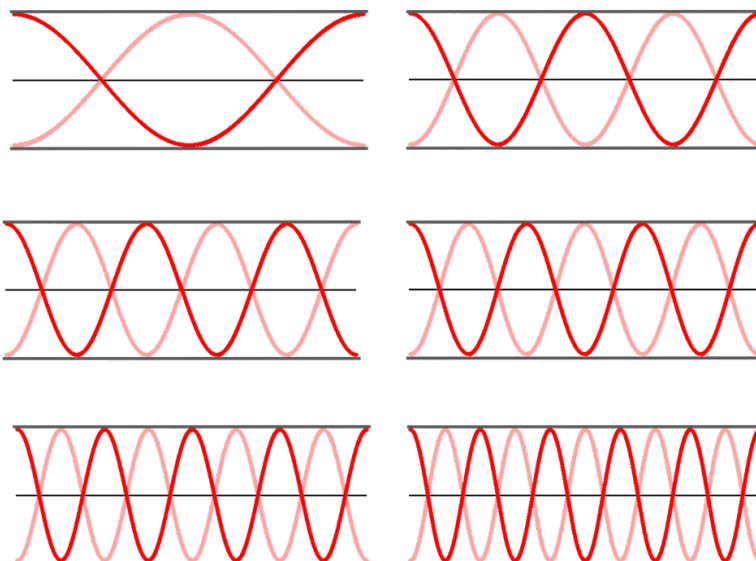


Question 17

The fundamental or first harmonic frequency of an open-end air column is 60 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 300 Hz.

**Question 18**

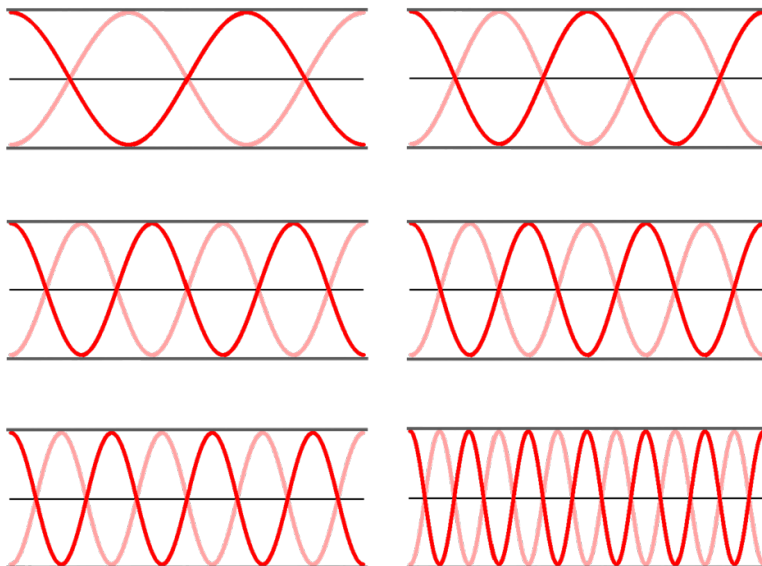
The fundamental or first harmonic frequency of an open-end air column is 120 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 600 Hz.



Question Group 11

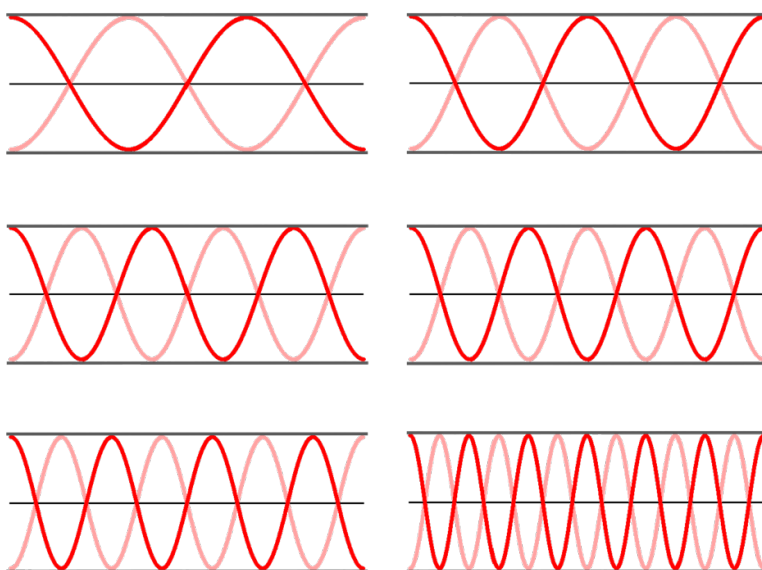
Question 19

The fundamental or first harmonic frequency of an open-end air column is 80 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 480 Hz.



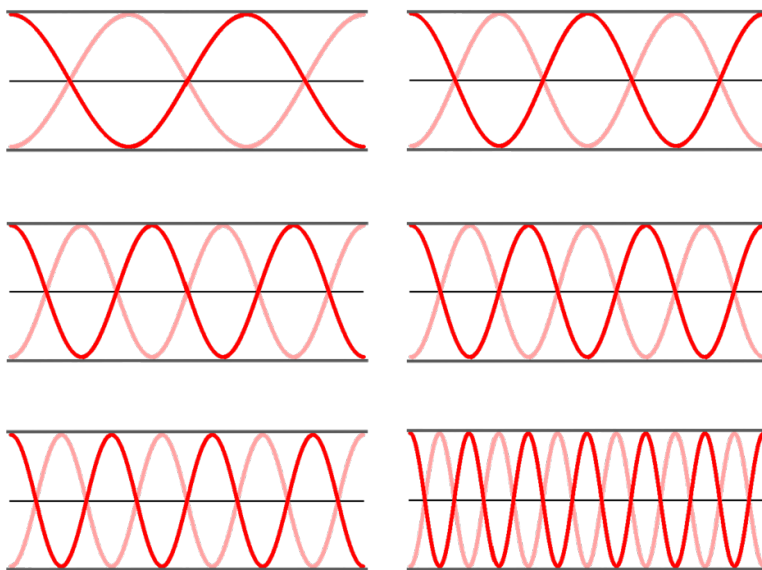
Question 20

The fundamental or first harmonic frequency of an open-end air column is 60 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 360 Hz.

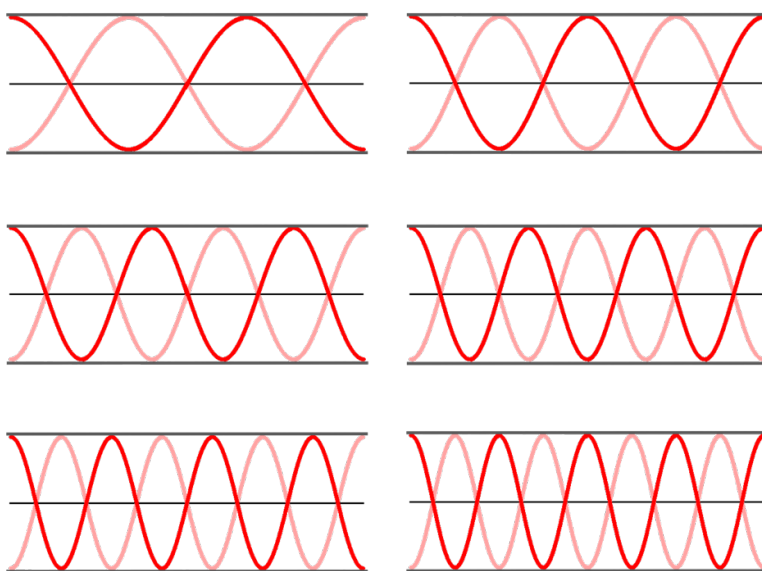


Question 21

The fundamental or first harmonic frequency of an open-end air column is 120 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 720 Hz.

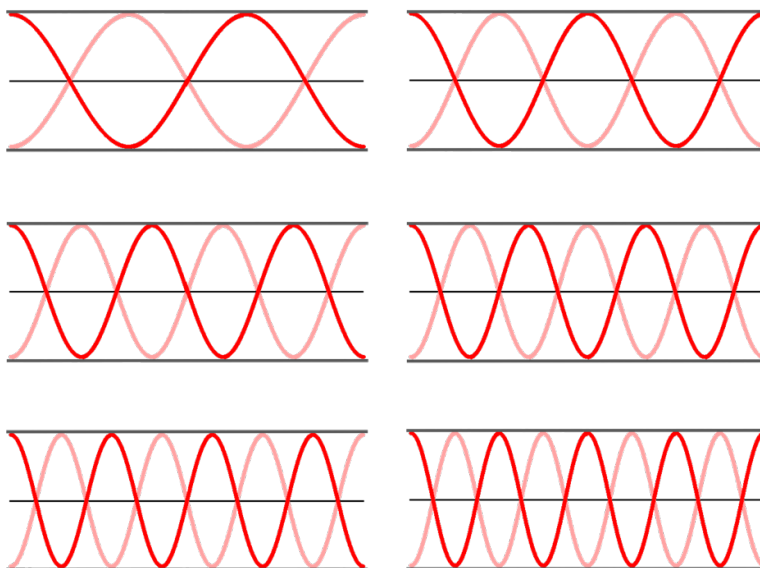
**Question Group 12****Question 22**

The fundamental or first harmonic frequency of an open-end air column is 80 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 560 Hz.

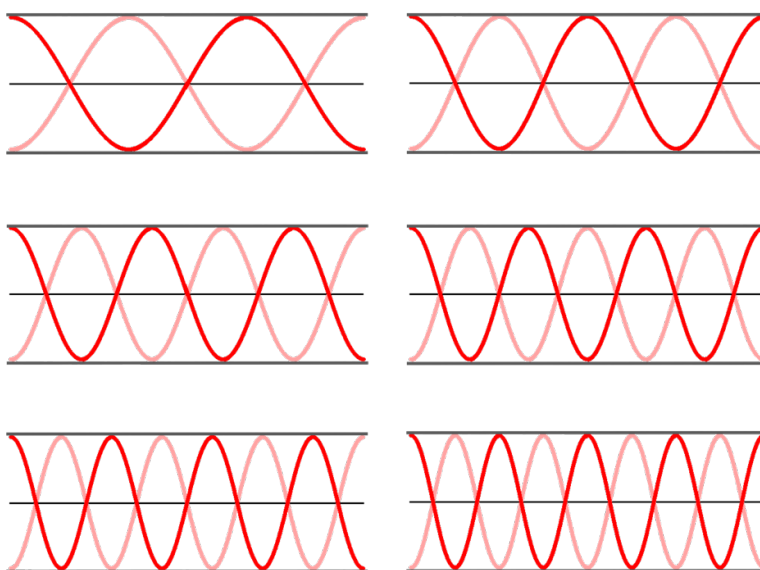


Question 23

The fundamental or first harmonic frequency of an open-end air column is 60 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 420 Hz.

**Question 24**

The fundamental or first harmonic frequency of an open-end air column is 120 Hz. The same air column is capable of vibrating with several other standing wave patterns. Identify the standing wave pattern for the harmonic that has a frequency of 840 Hz.

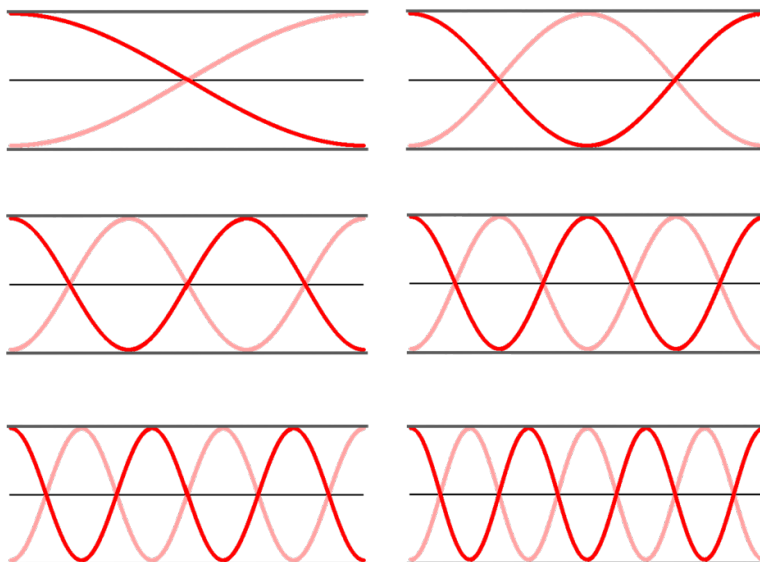


Activity 3

Question Group 13

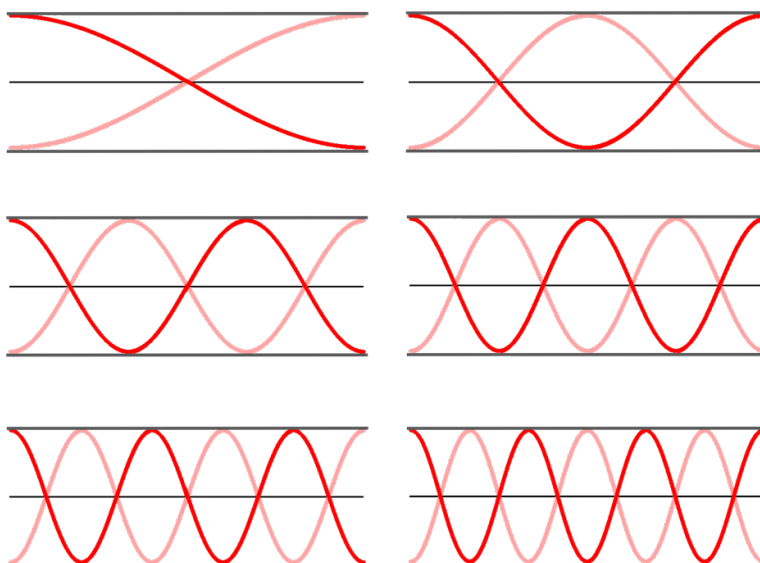
Question 25

An open-end air column has a length of 48 cm. Identify the standing wave pattern for the harmonic that has a wavelength of 96 cm.



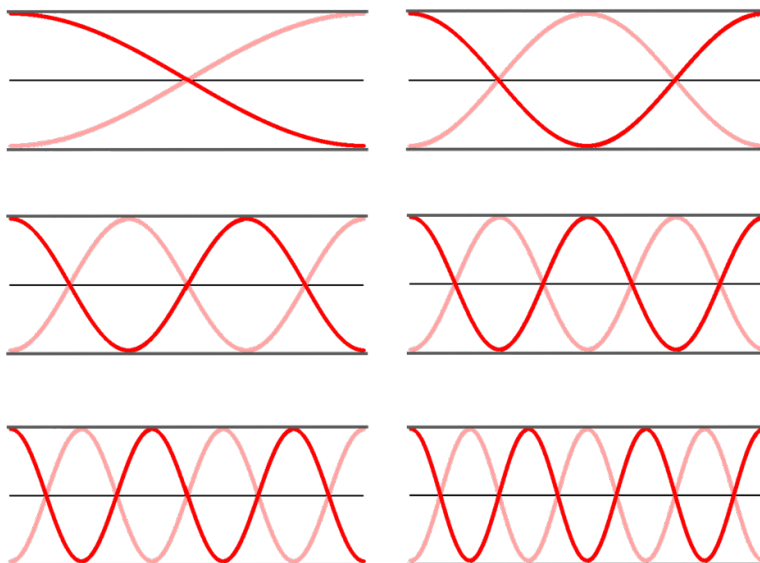
Question 26

An open-end air column has a length of 64 cm. Identify the standing wave pattern for the harmonic that has a wavelength of 128 cm.

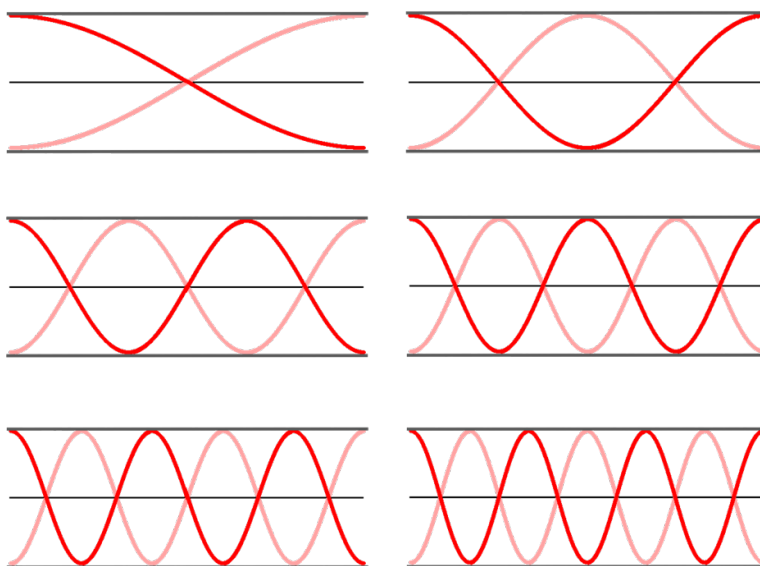


Question 27

An open-end air column has a length of 40 cm. Identify the standing wave pattern for the harmonic that has a wavelength of 80 cm.

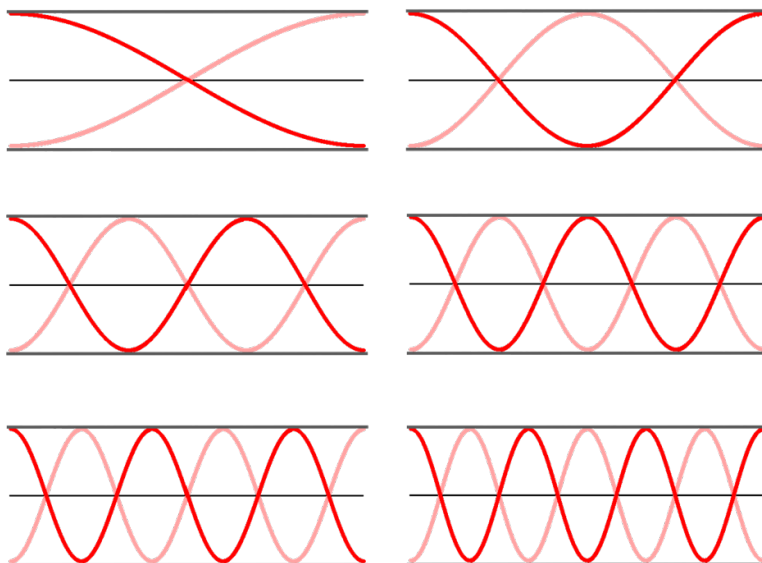
**Question Group 14****Question 28**

An open-end air column has a length of 48 cm. Identify the standing wave pattern for the harmonic that has a wavelength of 32 cm.

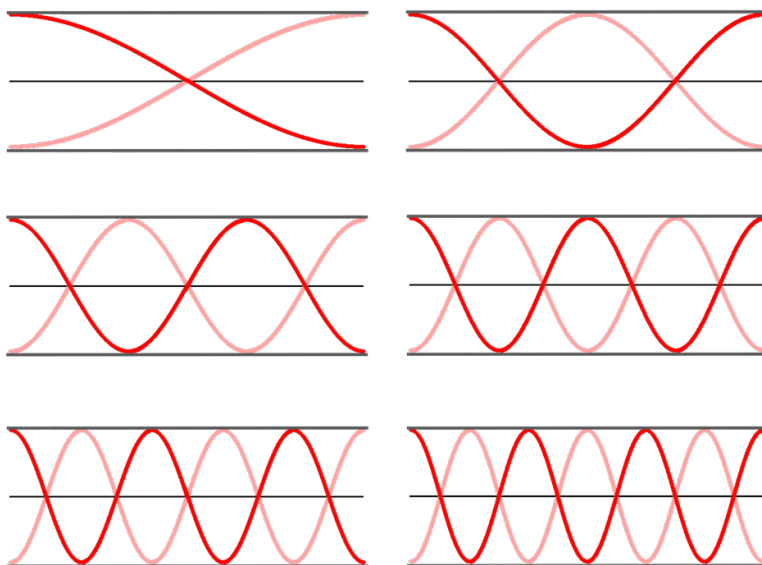


Question 29

An open-end air column has a length of 90 cm. Identify the standing wave pattern for the harmonic that has a wavelength of 60 cm.

**Question 30**

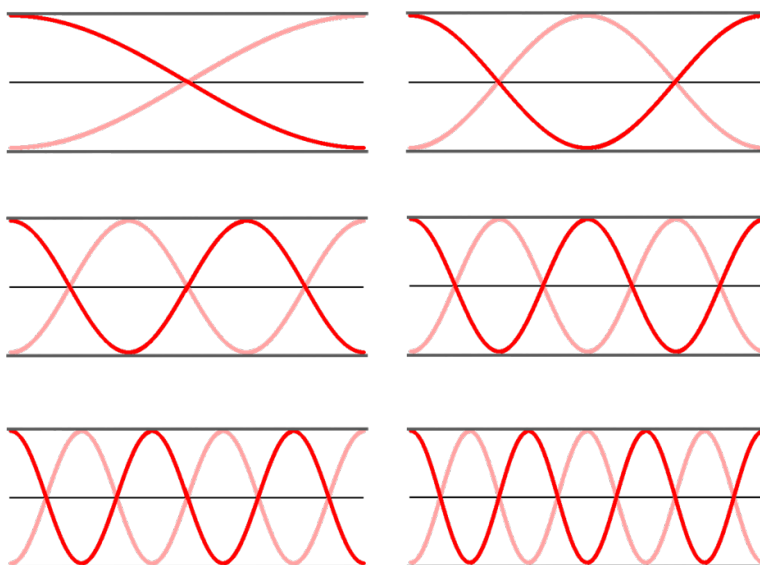
An open-end air column has a length of 60 cm. Identify the standing wave pattern for the harmonic that has a wavelength of 40 cm.



Question Group 15

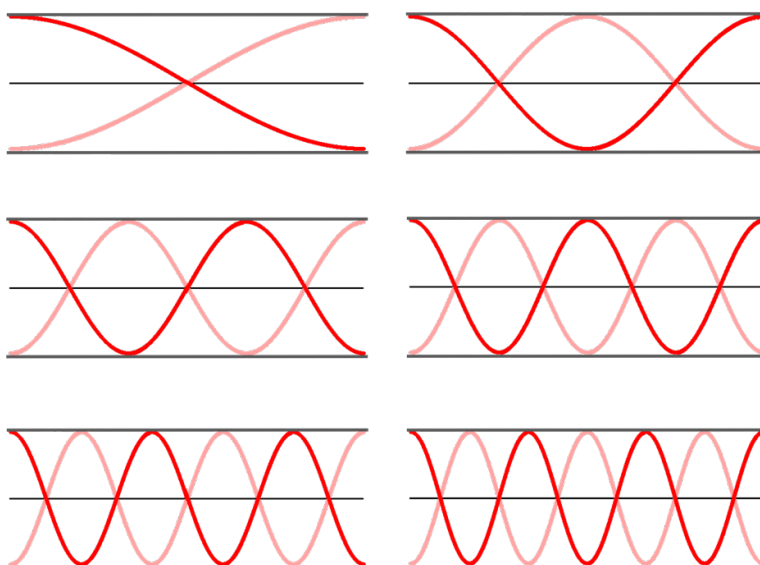
Question 31

An open-end air column has a length of 48 cm. Identify the standing wave pattern for the harmonic that has a wavelength of 24 cm.



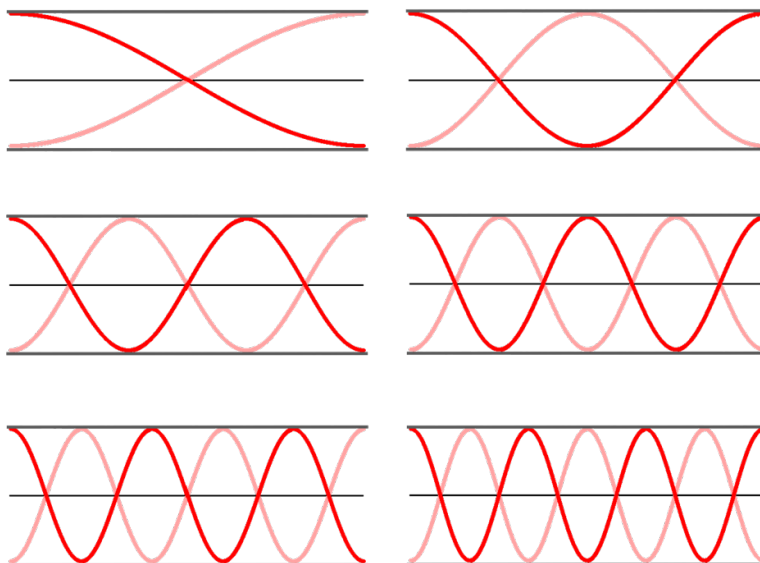
Question 32

An open-end air column has a length of 64 cm. Identify the standing wave pattern for the harmonic that has a wavelength of 32 cm.

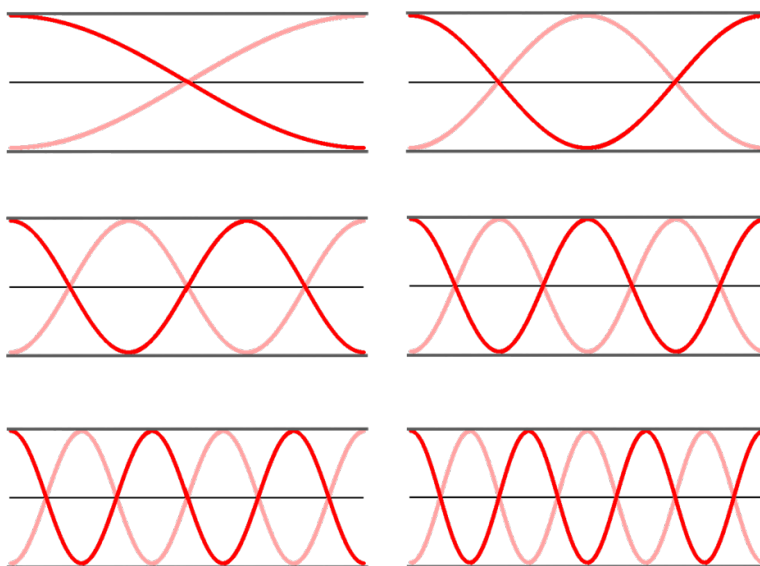


Question 33

An open-end air column has a length of 60 cm. Identify the standing wave pattern for the harmonic that has a wavelength of 30 cm.

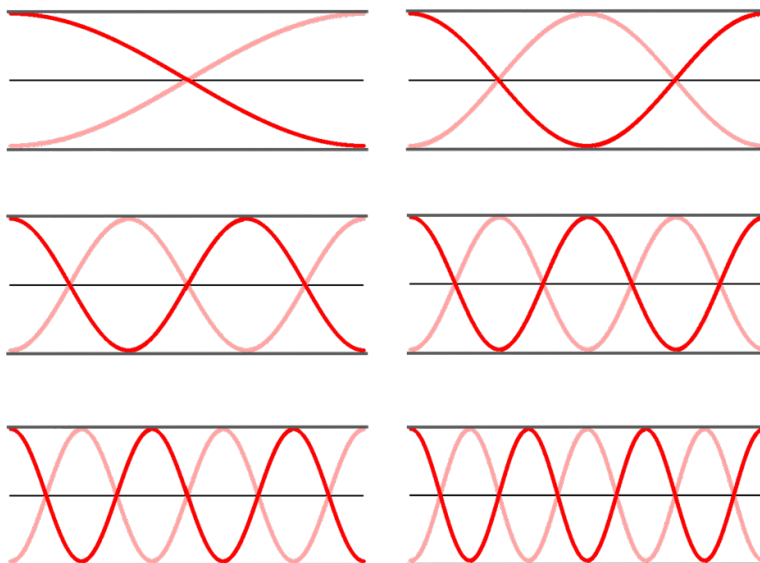
**Question Group 16****Question 34**

An open-end air column has a length of 50 cm. Identify the standing wave pattern for the harmonic that has a wavelength of 20 cm.



Question 35

An open-end air column has a length of 80 cm. Identify the standing wave pattern for the harmonic that has a wavelength of 32 cm.



Question 36

An open-end air column has a length of 60 cm. Identify the standing wave pattern for the harmonic that has a wavelength of 24 cm.

