VIB : 1DOF

Number of participants: 33

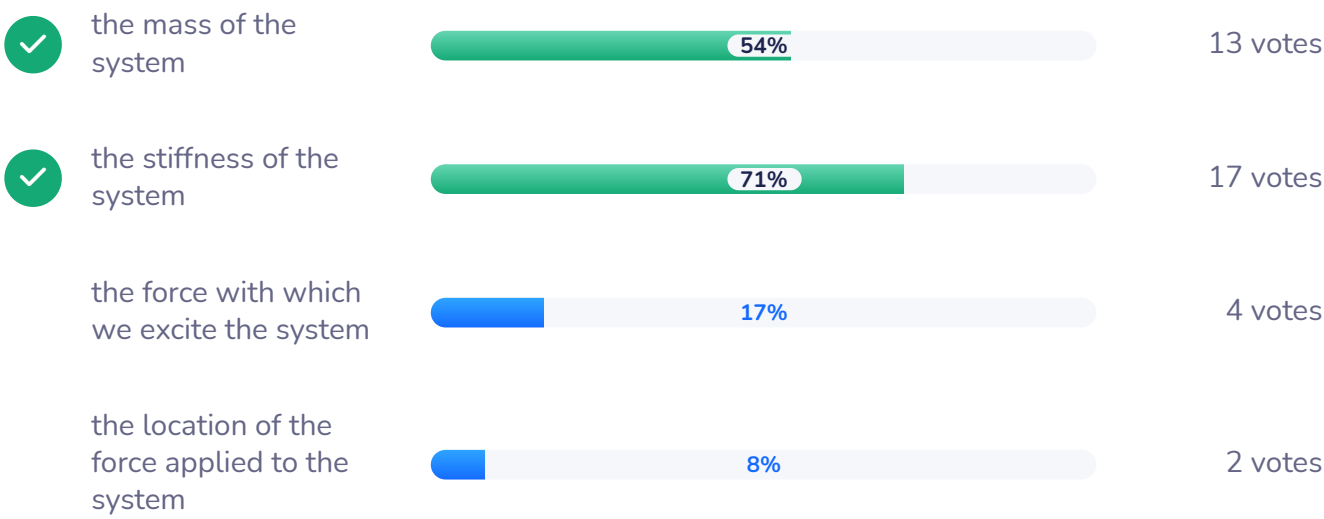
1. When describing a harmonic motion, the complex amplitude vector contains

16 correct answers
out of 21 respondents

	the phase information only	10%	2 votes
	the amplitude and the frequency information	14%	3 votes
✓	both the phase and amplitude information	76%	16 votes
	the frequency information only	0%	0 votes

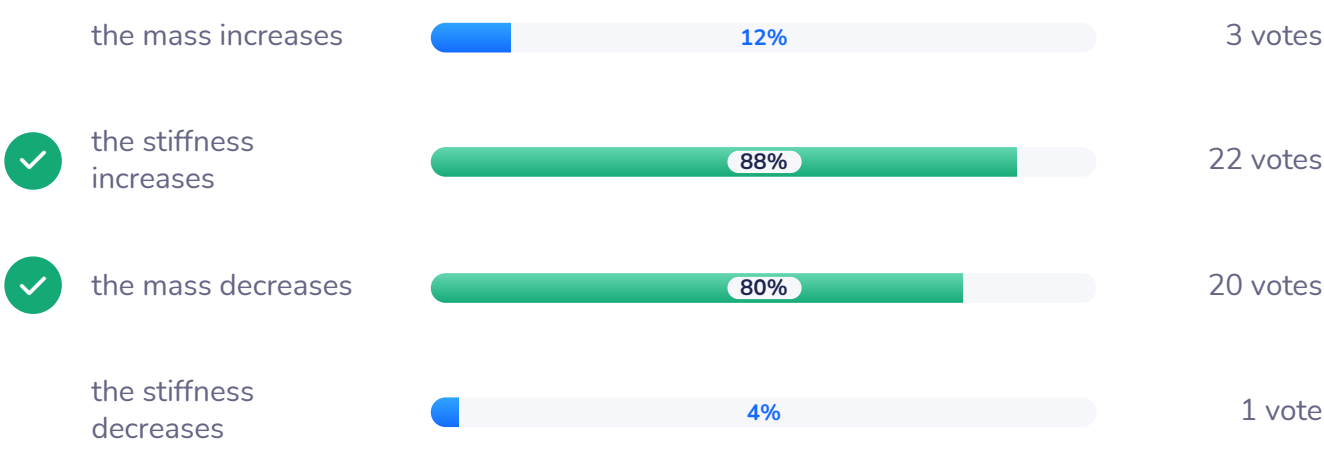
2. The natural frequency of a mass-spring system depends on

9 correct answers
out of 24 respondents



3. The natural frequency of a mass-spring system increases when

19 correct answers
out of 25 respondents



4. When an undamped 1DOF system is moved from the equilibrium position and then released, it oscillates freely at a frequency

19 correct answers
out of 25 respondents

	Lower than its natural frequency	20%	5 votes
✓	Equal to its natural frequency	76%	19 votes
	Higher than its natural frequency	4%	1 vote

5. When excited with a harmonic force at a frequency below the natural frequency of an undamped 1DOF system, the motion of the mass is

14 correct answers
out of 14 respondents

	180° out-of-phase with the excitation	0%	0 votes
	90° out-of-phase with the excitation	0%	0 votes
	30° out-of-phase with the excitation	0%	0 votes
✓	in-phase with the excitation	100%	14 votes

6. When excited with a harmonic force at a frequency above the natural frequency of an undamped 1DOF system, the motion of the mass is

15 correct answers
out of 23 respondents

✓	180° out-of-phase with the excitation	65%	15 votes
	90° out-of-phase with the excitation	22%	5 votes
	60° out-of-phase with the excitation	4%	1 vote
	random	9%	2 votes

7. For an undamped 1DOF system, when excited with a harmonic force at a frequency corresponding to its natural frequency, the amplitude of the motion is

23 correct answers
out of 25 respondents

	in phase with the excitation force	4%	1 vote
	180° out-of-phase with the excitation force	4%	1 vote
✓	infinite	92%	23 votes

8. It is possible to break a wine glass with your voice by

26 correct answers
out of 27 respondents

	exciting it at very high frequency	4%	1 vote
	exciting it at low frequency	0%	0 votes
✓	exciting it at one of its natural frequencies	96%	26 votes

9. Have you watched the videos before coming to class?

21 respondents

	Yes	52%	11 votes
	No	48%	10 votes

10. When damping increases in a 1DOF system, the amplitude of vibration when excited near its natural frequency

20 correct answers
out of 20 respondents

	increases	0%	0 votes
✓	decreases	100%	20 votes
	remains constant	0%	0 votes

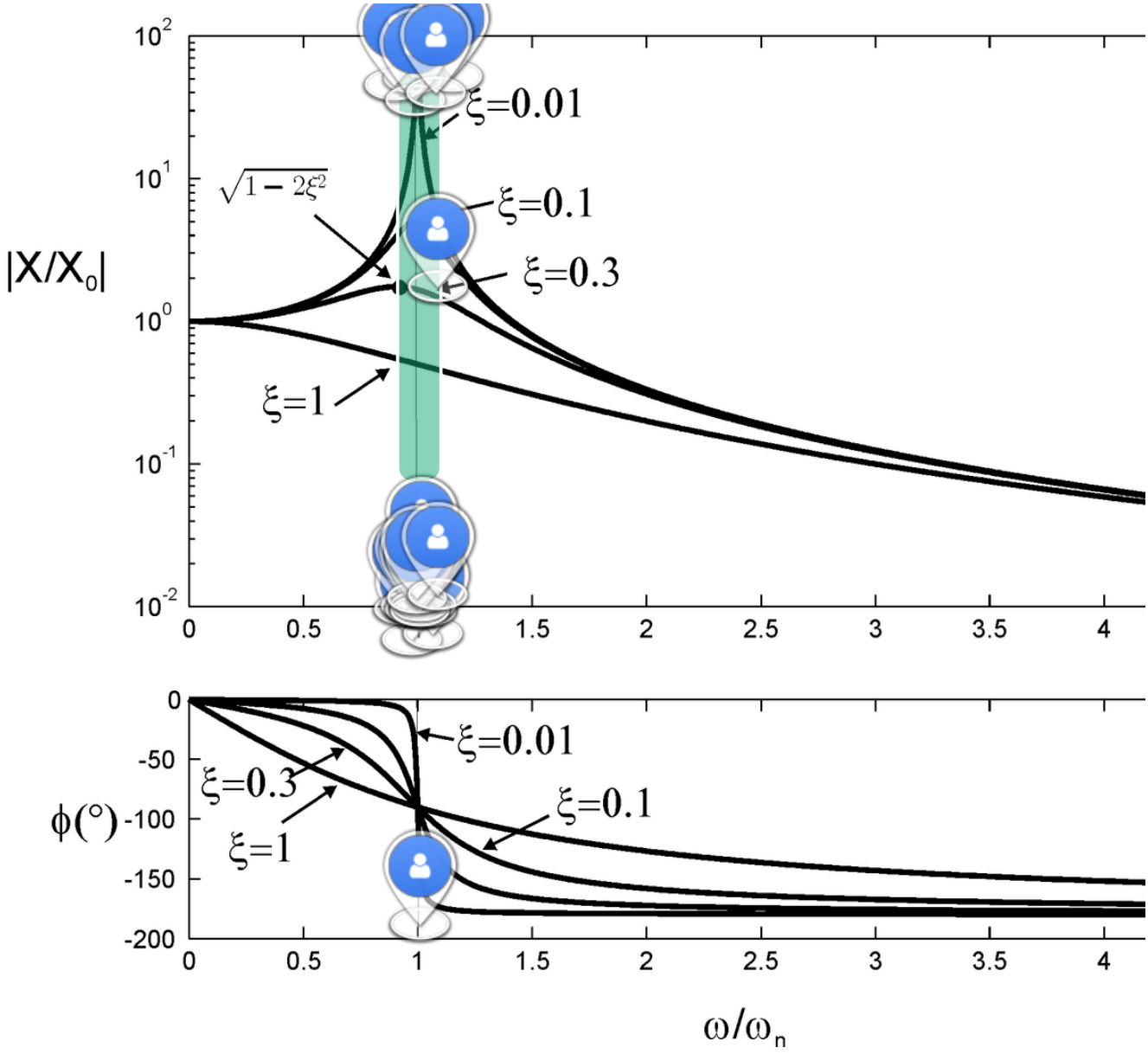
11. When damping increases in a 1DOF system, the amplitude of vibration when excited far from its natural frequency

14 correct answers
out of 23 respondents

	decreases	17%	4 votes
	increases	22%	5 votes
✓	remains constant	61%	14 votes

12. Where is the resonant frequency of the 1DOF system on this diagram ?

22 respondents



13. What method should you use to compute the time domain response of a SDOF when the force applied to it is arbitrary ? What kind of mathematical operator does it involve ?

2 correct answers
out of 14 respondents

- Integral convolution
- Fourier
- Sine sweep
- *
- Convolution of the force with impulse response
- Fourier analysis
- Time Differential
- Laplace transform
- Convolution integral
- Convolution
- Laplace transform
- integral
- Convolution
- Convolution product

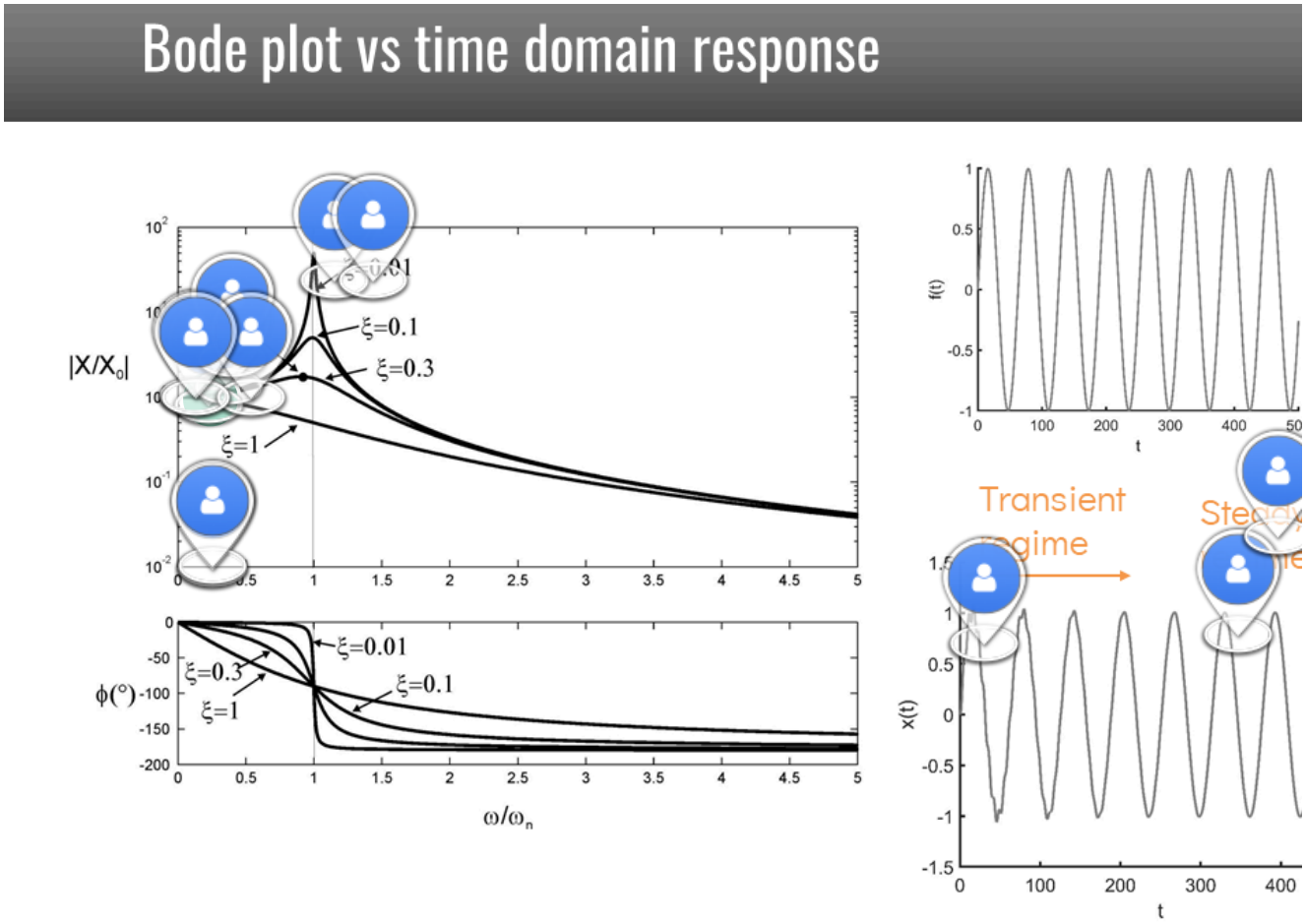
Correct answers

Duhamels's integral

convolution

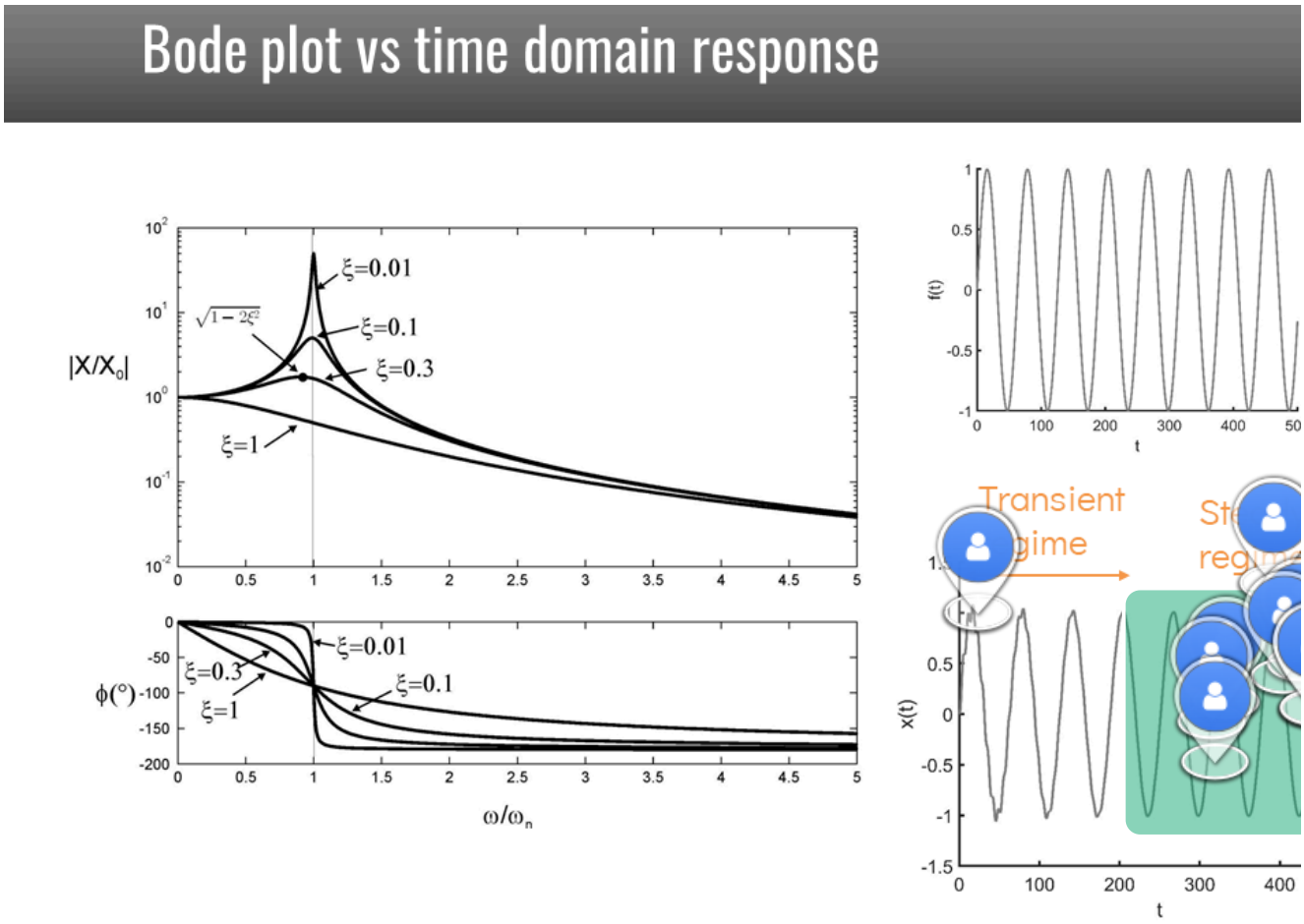
14. To which area of the bode plot does the time domain response presented in the graph correspond to ?

13 respondents



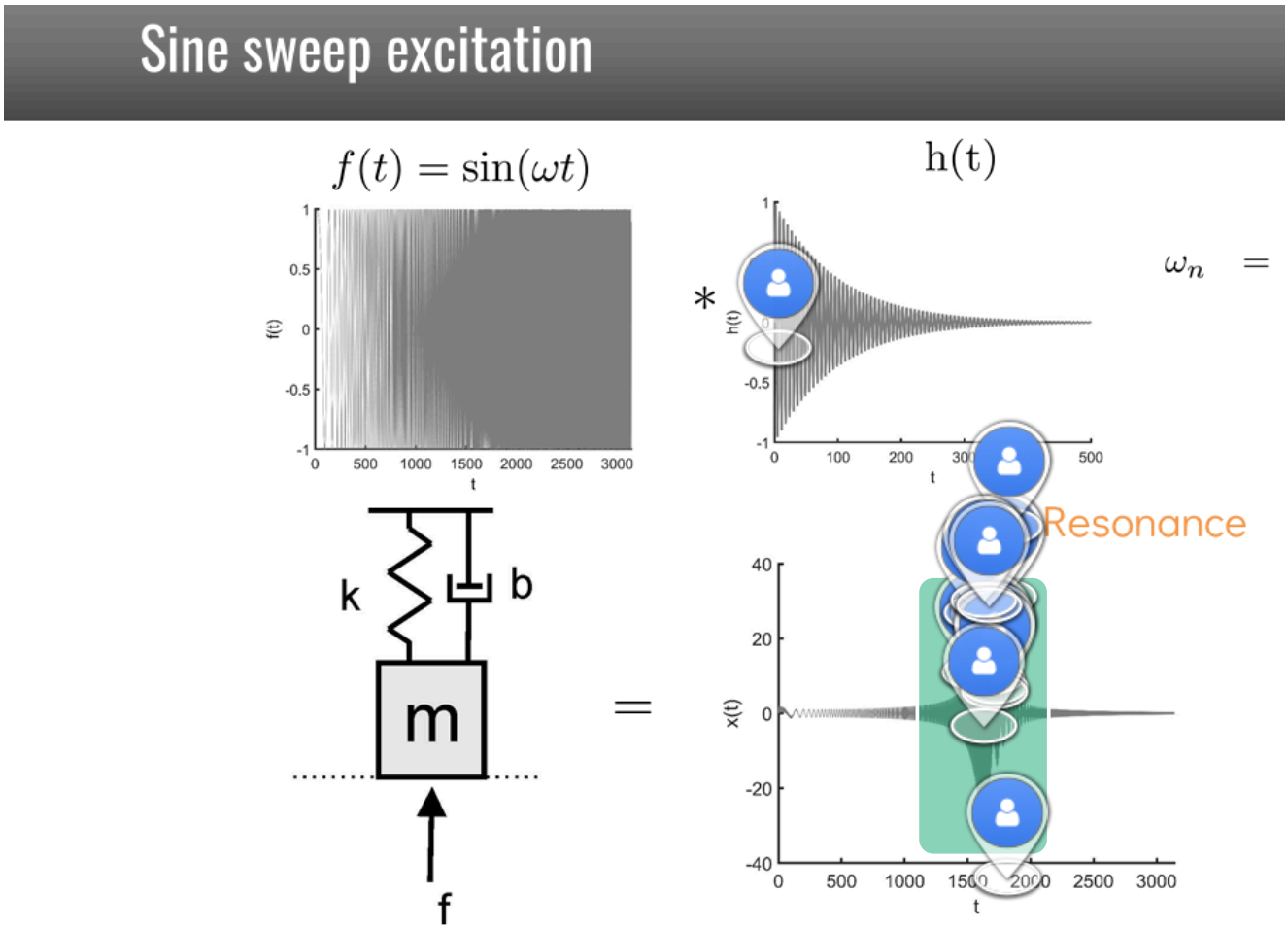
15. Which part of the time domain response actually corresponds to the hypothesis in the Bode plot ?

11 respondents



16. For a sine sweep excitation, which area of the time domain response represents resonance ?

12 respondents



17. For a SDOF system with an imposed motion at its base, in terms of which unknown is the equation of motion generally written ? Why ?

11 correct answers
out of 12 respondents

	the absolute displacement	8%	1 vote
✓	the relative displacement	92%	11 votes
	the absolute acceleration	0%	0 votes