Harmonics 4 Name _____

You are making harmonics on a string. In each of the following situations, identify a pattern that allows you to answer the question.
Two points per question:

1. If the second harmonic has a wavelength of 45 centimeters, what is the wavelength of the eighth harmonic?

2. If the first harmonic has a wavelength of 24 centimeters, what is the wavelength of the ninth harmonic?

3. If the sixth harmonic has a wavelength of 5 centimeters, what is the wavelength of the second harmonic?

4. If the eighth harmonic has a wavelength of 12 centimeters, what is the wavelength of the first harmonic?

5. If the third harmonic has a wavelength of 30 centimeters, what is the wavelength of the 14^{th} harmonic?

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6. If the fourth harmonic has a wavelength of 20 centimeters and a frequency of 24 Hertz, what is the frequency of the tenth harmonic?

7. If the first harmonic has a wavelength of 150 centimeters and a frequency of 8 Hertz, what is the frequency of the twelfth harmonic?

8. If the eighth harmonic has a wavelength of 10 centimeters and a speed of 900 cm/s, what is the frequency of the 5^{th} harmonic?

9. If the tenth harmonic has a wavelength of 6 centimeters and a speed of 1400 cm/s, what is the frequency of the first harmonic (the fundamental frequency)?

10. If the sixth harmonic has a frequency of 50 Hertz and a speed of 2000 cm/s, what is the wavelength of the seventh harmonic?

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Answers

1. 11.25 cm
2. 2.67 cm
3. 15 cm
4. 96 cm
5. 6.43 cm

6. 60 Hz
7. 96 Hz
8. 56.25 Hz
9. 23.33 Hz
10. 34.3 cm

[note: 6 and 7 actually include excess information, and can be solved using only the frequency pattern without information regarding wavelength. More on this in harmonics 5, where you create a formula that relates frequency and harmonic number!]