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. 10.67 cm
3. 15 cm
4. 6 cm
5. 6.43 cm

6. 60 Hz
7. 96 Hz
8. 56.25 Hz
9. 23.33 Hz
10. 46.67 Hz

[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!]