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| **Problem 21.10** |
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| Part A |  |
| What are the three longest wavelengths for standing waves on a 171-{\rm cm}-long string that is fixed at both ends? **Enter your answers in descending order separated by commas.**

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| --- | --- | --- | --- | --- | --- | --- |
| ANSWER: |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |   \lambda_1, \lambda_2, \lambda_3 = | ***Answer not displayed*** |   {\rm m} |  |

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 |
| Part B |  |
| If the frequency of the second-longest wavelength is 59 {\rm Hz}, what is the frequency of the third-longest wavelength? **Express your answer using two significant figures.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ANSWER: |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |   f_3 = | ***Answer not displayed*** |   {\rm Hz} |  |

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| **Problem 21.39** |
| A guitar string with a linear density of 2.00 g/m is stretched between supports that are 60.0 cm apart. The string is observed to form a standing wave with three antinodes when driven at a frequency of 440 Hz.

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| Part A |  |
| What is the frequency of the fifth harmonic of this string?

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| ANSWER: |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **733*****Correct***  |  Hz |  |

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| Part B |  |
| What is the tension in the string?

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ANSWER: |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | ***Answer not displayed*** |  N |  |

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