

# HOUSE . . . . . No. 1838

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By Mrs. Parente of Milford, petition of Marie J. Parente, Anthony J. Verga, Francis L. Marini and Shirley Gomes relative to the assessment of personal property taxes in cities and towns. Taxation.

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## The Commonwealth of Massachusetts

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In the Year One Thousand Nine Hundred and Ninety-Seven.

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### AN ACT RELATIVE TO THE PERSONAL PROPERTY TAX.

*Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:*

- 1 Chapter 59 of the General Laws is hereby amended by inserting
- 2 after section 34 the following section:—
- 3 Section 34A. Assessors shall certify as true, including valua-
- 4 tion, the true list brought in by each person concerning certain
- 5 tangible personal property located in a house or apartment which
- 6 is not the person's domicile if the assessors fail to conduct an
- 7 inspection of the listed personal property within forty-five days of
- 8 the receipt of the list. The preceding sentence shall not apply if
- 9 such a person refuses to answer a demand for inspection sent by
- 10 the assessors by certified mail to the person at the address on the
- 11 tax bill.

PHYSICS 551, FALL 2009

PROBLEM SET 1

Due: Monday, October 12, 2009

1. (10 points) A particle of mass  $m$  moves in a one-dimensional potential  $V(x) = \frac{1}{2}kx^2$ .

(a) Find the energy levels  $E_n$  and the corresponding wave functions  $\psi_n(x)$ .

(b) Calculate the expectation value of the position  $\langle x \rangle$  for the ground state.

(c) Calculate the expectation value of the momentum  $\langle p \rangle$  for the ground state.

(d) Calculate the expectation value of the energy  $\langle E \rangle$  for the ground state.

(e) Calculate the expectation value of the position  $\langle x \rangle$  for the first excited state.

(f) Calculate the expectation value of the momentum  $\langle p \rangle$  for the first excited state.

(g) Calculate the expectation value of the energy  $\langle E \rangle$  for the first excited state.

(h) Calculate the expectation value of the position  $\langle x \rangle$  for the second excited state.

(i) Calculate the expectation value of the momentum  $\langle p \rangle$  for the second excited state.

(j) Calculate the expectation value of the energy  $\langle E \rangle$  for the second excited state.

(k) Calculate the expectation value of the position  $\langle x \rangle$  for the third excited state.

(l) Calculate the expectation value of the momentum  $\langle p \rangle$  for the third excited state.

(m) Calculate the expectation value of the energy  $\langle E \rangle$  for the third excited state.

(n) Calculate the expectation value of the position  $\langle x \rangle$  for the fourth excited state.

(o) Calculate the expectation value of the momentum  $\langle p \rangle$  for the fourth excited state.

(p) Calculate the expectation value of the energy  $\langle E \rangle$  for the fourth excited state.

(q) Calculate the expectation value of the position  $\langle x \rangle$  for the fifth excited state.

(r) Calculate the expectation value of the momentum  $\langle p \rangle$  for the fifth excited state.

(s) Calculate the expectation value of the energy  $\langle E \rangle$  for the fifth excited state.

(t) Calculate the expectation value of the position  $\langle x \rangle$  for the sixth excited state.

(u) Calculate the expectation value of the momentum  $\langle p \rangle$  for the sixth excited state.

(v) Calculate the expectation value of the energy  $\langle E \rangle$  for the sixth excited state.

(w) Calculate the expectation value of the position  $\langle x \rangle$  for the seventh excited state.

(x) Calculate the expectation value of the momentum  $\langle p \rangle$  for the seventh excited state.

(y) Calculate the expectation value of the energy  $\langle E \rangle$  for the seventh excited state.