1.

Experience Music Project, an interactive music museum in Seattle, charged adult visitors a $19.95 admission fee in 2005. Groups of 15 or more could enter for $14.50 per person.†



(a) Create a table for group cost as a function of group size. (Show the cost for groups of 1 to 20 people.)

|  |  |
| --- | --- |
| **Size** | **Cost** |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 |  |
| 11 |  |
| 12 |  |
| 13 |  |
| 14 |  |
| 15 |  |
| 16 |  |
| 17 |  |
| 18 |  |
| 19 |  |
| 20 |  |

(b) Write the total cost of admission, *C*, as a function of the number of people in a group, *n*. Confirm that the function and the table from part (a) are in agreement.

*C*(*n*) =

|  |
| --- |
| http://www.webassign.net/wastatic/wacache084b6fbb10729ed4da8c3d3f5a3ae7c9/watex/img/leftbrace4.gif |

|  |  |
| --- | --- |
|  , |     *n* < 15 |
|  , |     *n* ≥ 15 |

(c) Calculate the cost of admitting a group of 14 people and the cost of admitting a group of 15 people.

|  |  |  |
| --- | --- | --- |
| group of 14 people |      | $  |
| group of 15 people |      | $  |

(d) Determine the largest group you could bring in and still remain below the cost of a 14-person group.

A group of  people at a cost of $  .

2.

In recent years, the number of married mothers who choose to stay at home to care for their families and bypass an outside career has increased. The function

*M*(*t*) =

|  |
| --- |
| 948.2 |
| 1 + 27.23*e*−1.110*t* |

 + 4700

models the number of married couple families with stay-at-home mothers (in thousands) as a function of the number of years since 1999, *t*.†



(a) Describe what the rate of change of the function tells about how the number of married, stay-at-home mothers is changing over time.

As time increases, the number of stay-at-home mothers is    at    rate and then    at    rate until     .

(b) Estimate the coordinates of the inflection point. (Round your answers to the nearest whole number.)

(*t*, *M*(*t*)) =

|  |
| --- |
| http://www.webassign.net/wastatic/wacache084b6fbb10729ed4da8c3d3f5a3ae7c9/watex/img/leftparen1.gif |



|  |
| --- |
| http://www.webassign.net/wastatic/wacache084b6fbb10729ed4da8c3d3f5a3ae7c9/watex/img/rightparen1.gif |

Explain what each value means in this context.

In this context,  years after 1999, the number of stay-at-home mothers is  thousand and the rate of    will begin to    after this year.

(c) Find the average rate of change from

*t* = 4 to *t* = 7

 for the function. (Round your answer to two decimal places.)


Explain the meaning of this rate of change.

The number of stay-at-home mothers is    by an average of  thousand each year from the year  to  .

(d) What are the limiting values for the function? (Round your answers to the nearest whole number.)

|  |  |
| --- | --- |
| lower limiting value      |  |
| upper limiting value      |  |

What do they mean in the context of the stay-at-home mothers?

The lower limiting value of  thousand is the number of stay-at-home mothers    . The upper limiting value of  thousand is the number of stay-at-home mothers    .