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| Group Quiz 3Dusty Wilson Math 111 No work = no credit | **Name**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

Answer the following:

1. Use the properties of logs to write the expression  as a single logarithm.
2. Write the expression  as the sum or difference of logarithmic functions containing no exponents.

Seahawk fans at the Clink are competing with Chief fans at Arrowhead Stadium for the distinction of being the loudest fans in the world. At present, the Chief fans are tops having generated fan noise of 142.2 db shattering our record of 137.6 db.

How much louder (more intense) must the 12’s be than their previous high if they are to once again hold the distinction of being the loudest fans?

Use the fact that  where  is the threshold of hearing for the average human ear. Then find the ratio .

The table below shows Washington State’s population, in millions, from 1980 to 2010.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Year | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 |
| Washington Population (in millions) | 4.23 | 4.46 | 5.02 | 5.47 | 5.89 | 6.26 | 6.81 |

1. Find a linear model  for Washington State’s population (in millions) *t* years since 1980. Round *a* and *b* to two decimal places.
2. Explain the meaning of the coefficient *a* and *b* in your linear model using everyday language.
3. Find the exponential model  for the Washington State population (in millions) *t* years since 1980. Round *a* to two decimal places and round *b* to the four decimal places.
4. Explain the meaning of the coefficient *a* and *b* in your exponential model using everyday language.
5. Use your exponential model to approximate Washington State’s population in 2020. Interpret your result.
6. Use your exponential model to algebraically determine when Washington State’s population will reach 10 million (according to the model). Interpret your answer.