

1 The volume fraction of carbon dioxide in the atmosphere of the earth used to be about 0.03% before the industrial revolution. It is now around 0.04%. The molecular mass of carbon dioxide is 44 amu, while that of the atmospheric air is 29 amu. What is the ratio of the mass fraction of carbon dioxide in today's atmosphere, to that of before the industrial revolution?

2 An acre is the area of a rectangle with the sides equal to 22 yards by 220 yards. A yard is 0.9 meter. How many square meters is one acre?

3 The intensity (power per surface area) of the sun above the atmosphere of the earth is (1.4 k W m^{-2}). The distance between the earth and the sun is 150 million kilometers. What is the power of the sun?

4 The density of mercury is 13.6 times the density of water. The molar mass of mercury is 200 g mol^{-1} . The molar mass of water is 18 g mol^{-1} . What is the ratio of the mean distance between two neighboring molecules in mercury to the same quantity in water? Express your answer with 2 significant digits.

5 The body mass index (BMI) is defined as the ratio of mass in kg, divided by the square of height in m. *A* has a mass 50 kg and a height 170 cm, and *B* has a mass 100 kg and a height 200 cm? What is the ratio of the BMI of *B* to that of *A*?

6 Good luck

English for special purposes

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Please write the answers in boxes and return only the answer sheet.

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1

1.3

2

4000

3

4×10^{26}

4

0.93

5

1.45