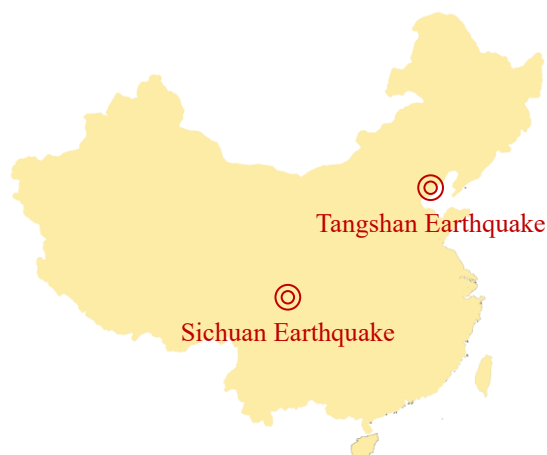


Name: _____ () Class: _____ Date: _____

S4 Tangshan Earthquake and Sichuan Earthquake

China is located between the world's two major *seismic zones* and is subject to frequent *seismic activity*. Since records began, there are 442 earthquakes that caused deaths in China. The Sichuan Earthquake (2008) and the Tangshan Earthquake (1976) are the two deadliest earthquakes in the recent history of China.



Epicentre positions of Tangshan Earthquake and Sichuan Earthquake



A building collapsed in the Sichuan Earthquake

seismic zone 地震帶 seismic activity 地震活動

Consider the following information about the two earthquakes. Answer the following questions.

Give the answers correct to 3 significant figures if necessary.

	Tangshan Earthquake	Sichuan Earthquake
Date	28 July 1976	12 May 2008
Time	03:42:54	14:28:04
Magnitude on the Richter Scale	7.8	8.0
Depth	6 km	19 km
<i>Epicentre Position</i>	12 km under the southern part of Tangshan	80 km west-northwest of Chengdu
Number of Deaths	About 242 000	69 227

1. The magnitude M of an earthquake measured on the Richter Scale is given by $M = \frac{2}{3} \log \frac{E}{10^{4.8}}$, where

E is the energy (in J) released by the earthquake and $E > 0$.

- (a) (i) Find the energy released by the Tangshan Earthquake.

(ii) Find the energy released by the Sichuan Earthquake.

(b) How many times was the energy released by the Sichuan Earthquake of that released by the Tangshan Earthquake?

(c) Suppose the atomic bomb dropped on Hiroshima during World War II has released about 1.5×10^{13} J of energy. By considering the energy released, how many Hiroshima bombs is equal to the Sichuan Earthquake?

