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Algebraic and Transcendental Functions

Exponential Growth and Decay: Multicultural Project

ACTIVITY

To start your research do the following questions;

1. Why hasn't it been possible to contain the nuclear energy and substances generated by the nuclear reactor's explosion in Chernobyl in 1986?

Because 5% of the nuclear material still remains in the atmosphere.

2. What is that makes nuclear energy to be so dangerous?

Nuclear energy is based completely on radiation, and when a human being is exposed to radiation they are exposing themselves to cancer.

3. Why is it said that a nuclear reaction generates an exponential growth of the atoms?

In a reaction, neutrons can be released and a spontaneous fusion may occur.

4. When will all the nuclear energy and substances released by this explosion be dissolved, can they be cleaned out completely?

The area won't be safe for human habitation for at least 20,000 years.

INTRO: (Name, Id#, Campus and brief summary of project.)

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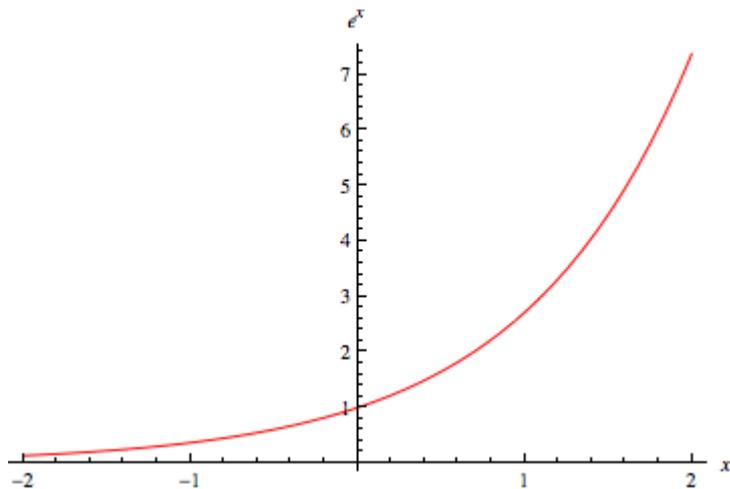
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For this project we are going to be talking about:

The exponential function and its reference point, domain and range, the Chernobyl Nuclear disasters and events in which exponential growth and decay has occurred

PART 1:

Def of Exponential function: Basic graph in which: $f(x)=b^x$ where $b>0$ and $b\neq 1$
graph:



reference point: (0,1)
 domain: $(-\infty, \infty)$
 range: $(0, \infty)$
 asymptote: $y=0$
 graph is INCREASING

PART 2:

Summary of chernobyl nuclear disaster:

-

Two different real events / situations that are also examples of exponential growth and decay:

Example #1 of exponential growth can be seen when a business invests an amount of money in a company and each certain period of time at an established rate the money accumulates generating interest.

Example #2 of exponential growth can be seen in China which is a country that is characterized with a constant increment of population having in 1955 a population of approximately six hundred million people and to the actual date having a billion.

CONCLUSION:

Questions in activity.

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Why is it said that a nuclear reaction generates an exponential growth of the atoms? In a reaction, neutrons can be released and a spontaneous fusion may occur.

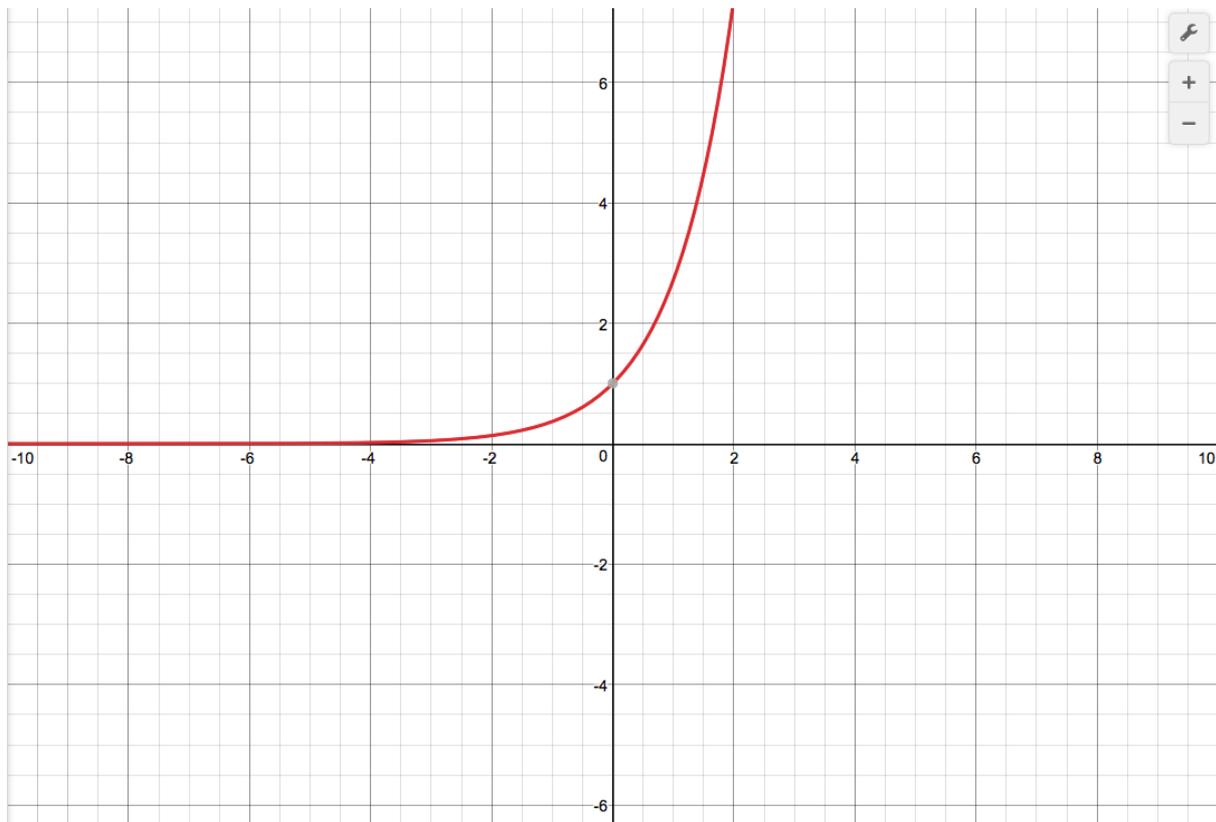
When will all the nuclear energy and substances released by this explosion be dissolved, can they be cleaned out completely?

The area won't be safe for human habitation for at least 20,000 years.

1What is exponential growth?

Exponential growth is exhibited when the growth rate of the value of a mathematical function is proportional to the function's current value, resulting in its growth with time being an exponential function.

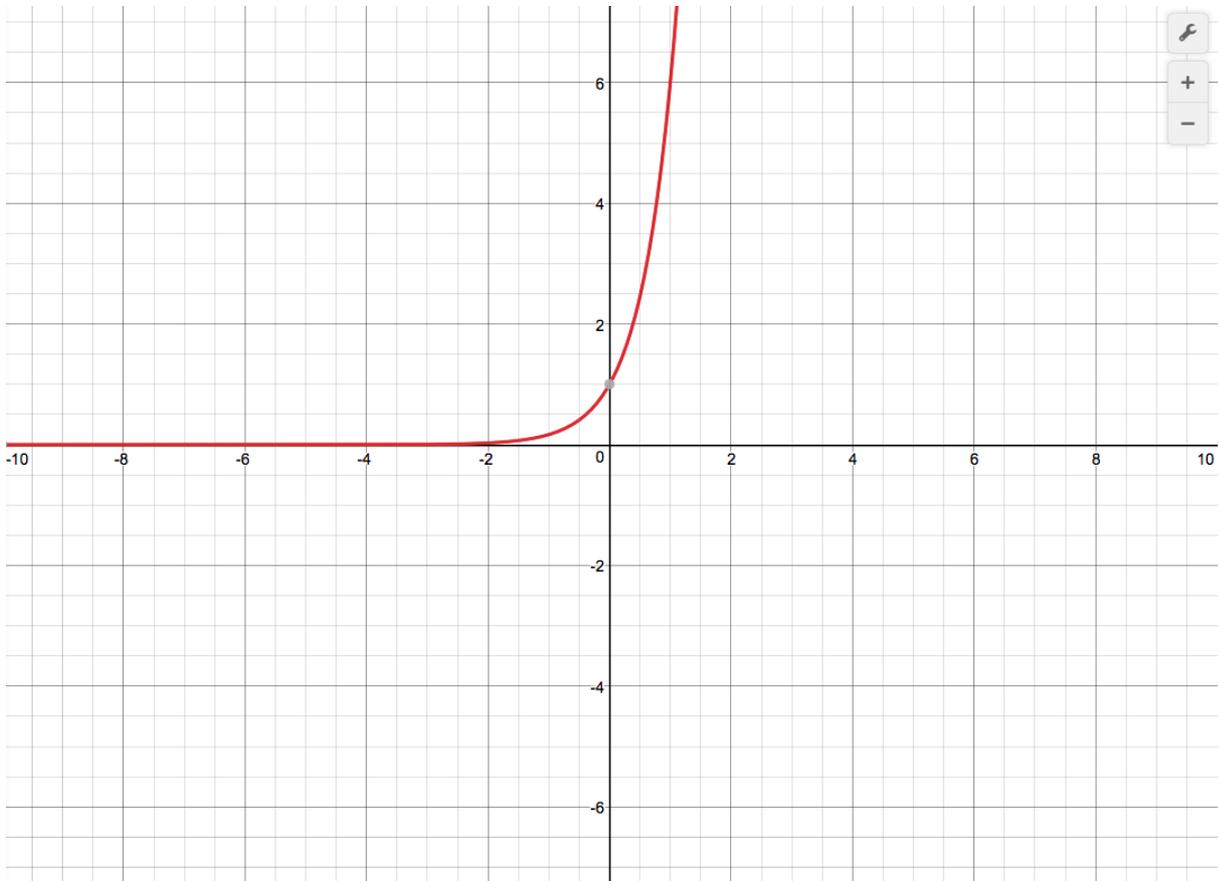
2What is the function and graph that models and represents it?



$f(x) =$

e^x

What are their main characteristics? (include a picture of your team's visual / graphic summary)



$$f(x) = 6^x$$

1. What is exponential decay?

A quantity is subject to **exponential decay** if it decreases at a rate proportional to its current value.

2. What are the implications of using nuclear energy?

The waste from nuclear energy is extremely dangerous and it has to be carefully looked after for several thousand years. Nuclear energy is based on uranium, and it's a nonrenewable resource, the wastes can be used to create nuclear weapons used for terrorism.

3. Do you consider nuclear energy to be clean energy? (justify your answer)

We consider it's not clean because even though Nuclear power plants emit absolutely no carbon dioxide, nitrogen oxides or sulphur dioxides. Nuclear residues stay for generations and generations and the effects of these residues are very hazardous.

4. Are you aware that there is a Nuclear Energy Plant in Mexico?

I wasn't aware of this.

5. Where is it?

It is located near the Pacific Ocean in Verde Lima, Veracruz.

6. Do you think it is safe?

Since it is regulated by CFE and Secretaría de Energía, as long as an accident doesn't happen it's safe.

7. Do you agree with the fact that there is a Nuclear Energy plant in your country? (Justify your answer)

I agree because it saves more than 6 895 000 petroleum barrels per year.

8. Could the Chernobyl 1986 nuclear disaster have been prevented? How?

Yes, by correctly following safety procedures, not disabling all safety systems before performing improvised tests and creating a proper containing building because the building where the plant was located wasn't stable enough.

9. Once the explosion happened, was there any way to stop the radiation spread and its pollution?

No, because the explosion happened immediately and unexpectedly so there wasn't any way to reduce the radiation levels.

10. Do you think that the radioactive pollution generated by this disaster reached Mexico? (Justify your answer).

Yes, over 100 radioactive elements released during the explosion contaminated soil and waterways in Ukraine, Belarus and Russia. Many other neighbouring countries - Austria, Finland, Germany, Norway, Romania and Sweden - suffered radioactive contamination as well. The fallout from Chernobyl reached as far as Canada, the United States and Mexico.

11. What are at least 4 environmental consequences (in a global scale) of the Chernobyl 1986 disaster?

Aquatic bodies are still being contaminated by runoff of long-lived caesium-137 and strontium-90 released from contaminated soils. Animals living in contaminated areas in and around Chernobyl have suffered from a variety of side effects caused by radiation. A forest was renamed as the Red Forest because it's completely dead. More than 10 countries were reached by nuclear pollution.

12. What are the environmental consequences (in a global scale) of other nuclear disasters and use of nuclear weapons?

Neighboring countries will be also affected by the mistakes of the other countries.

13. What do you think and feel about these consequences?

I feel that it's not fair that other countries are harmed by the ignorance of one country.

14. What would be a solution proposal for this situation?

The total elimination of nuclear power, it's unnecessary, harmful and hazardous.

15. How did we feel working like this? Did we like it? Was it difficult? What did I like the most of working with my teammates in this form?

We really liked doing the research for this project, I liked working with my teammates because we all did what we were supposed to do.

APA:

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