CELL DIVISION LAB

In order to be considered living, an organism must be able to **reproduce** (to make more of yourself).   All cells can reproduce, and all cells reproduce in the same way. Whether the cell is a **unicellular organism** (a solitary organism made of just one cell) or a **multicellular organism** (an organism with millions, billions, or even trillions of cells), they all reproduce by cellular division. Simply put, the cells divide in half in order to create new cells. When this happens the **parent cell** turns into 2 **daughter cells**. The scientific name for this division process is called **mitosis**. Interestingly, a cell must "divide" in order to "multiply."

The amount of time it takes for one cell to completely divide in most mammals, including the human body, is about 24 hours. Some cells take more or less time, depending on their purpose; a fly embryo takes only eight minutes to divide, for example, while a human liver cell could take more than a year. **Gametes,** cells used in sexual reproduction, can take decades to divide. Abnormal cell division can also occur, resulting in **cancerous** cells that multiply much more rapidly.

Average Cell Division Times

Cell Type	Process	Time
fly embryo	mitosis	8 minutes
bacteria	mitosis	20 minutes
yeast	mitosis	2 hours
human skin	mitosis	20 - 24 hours
human sperm	meiosis	about 64 days
human liver	mitosis	1 year or more
human egg	meiosis	up to 40 years or more
human nerve	mitosis	never, once mature

a parent cell dividing into 2 daughter cells

Complete the chart to reveal how many cells can be created in just 20 rounds of mitosis.   The first couple rounds of mitosis have been done for you.

Mitosis division	Starting cell	Division 1	Division 2	Division 3	Division 4	Division 5	Division 6	Division 7	Division 8	Division 9	Division 10
Number of cells made	1	2	4								

Mitosis division	Division 11	Division 12	Division 13	Division 14	Division 15	Division 16	Division 17	Division 18	Division 19	Division 20
Number of cells made										

1. If a bacterium reproduces once every 20 minutes, it can do 3 divisions in an hour. If all you got was 1 bacterium on your hand in the morning, how many would be on your hand by the end of the school day? _____

2. A person takes a shower once every 24 hours. How many rounds of mitosis can your armpit bacteria do? Can you calculate how many bacteria could possibly be there? (2PTS)
_____   _____

3. Bacteria can't always reproduce this fast. What factors might limit their growth? _____

4. What might limit bacterial growth on your hand? On your armpits? In your mouth at night? (3PTS)
_____ _____ _____

5. If a doctor performed a surgery on your liver, she would have to cut through skin, fat, and muscle tissue before getting to the liver organ. Which part of your body would heal the fastest? _____

6. If your leg got a deep cut that severed a nerve cell leading to your toes, what would the consequence be?
_____

7. Looking at the chart above, there is a word used other than "mitosis." What is it? What does it mean? What kinds of cells undergo this process? (3PTS)
_____ _____ _____

8. Skin cells, muscle cells, heart cells, bone cells, etc all contain 46 **chromosomes** (bundles of DNA). Egg cells and sperm cells only contain 23 chromosomes. Why?
_____

Now, using your data, complete a mitosis graph. Label both the x-axis and the y-axis. (4pts) Accurately plot all data. (10pts) Be sure to give the graph a good title. (2pts)
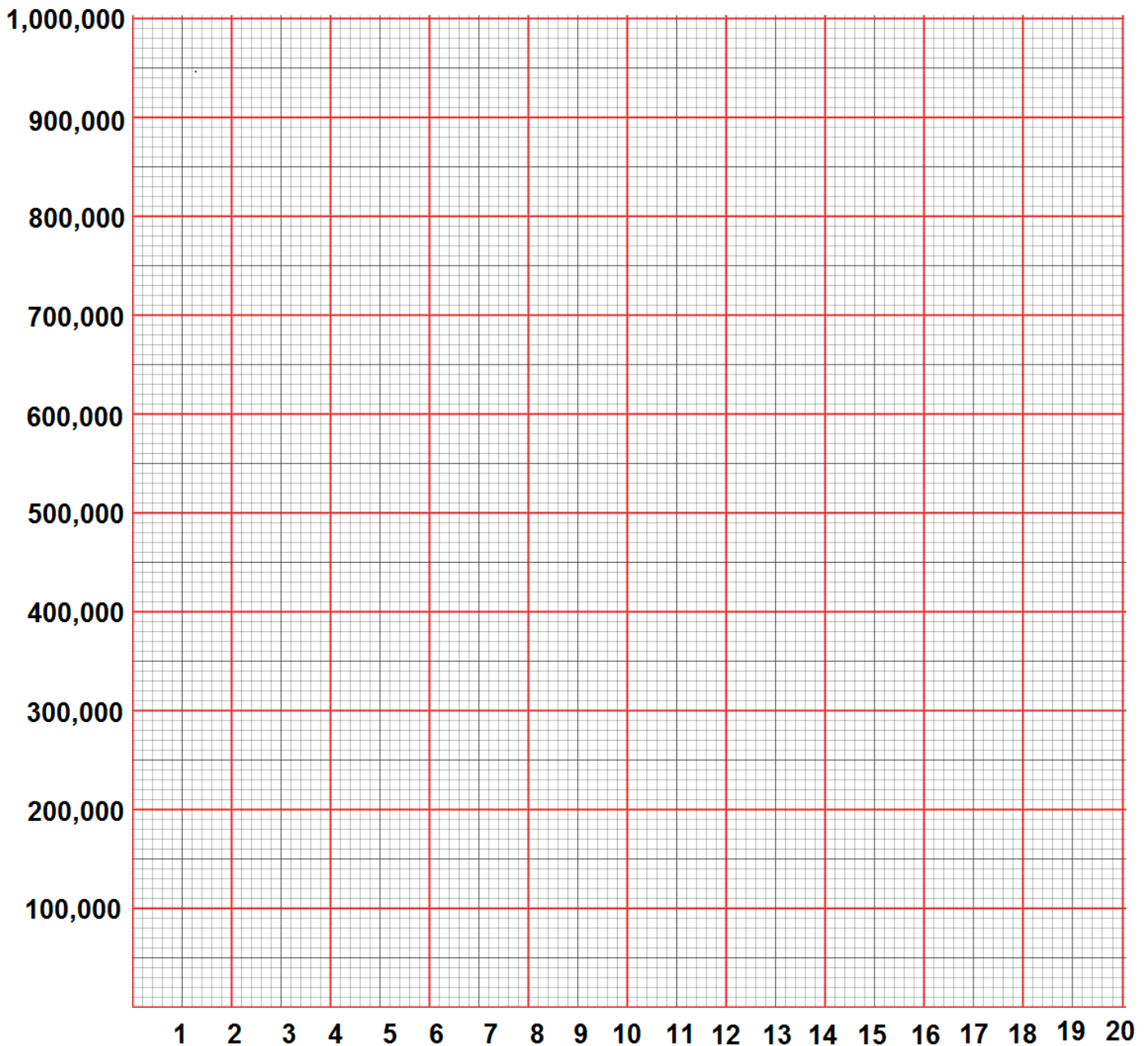
9. This graph line is different in shape compared to most graph lines. It is called an **EXPONENTIAL** graph line. What does exponential mean?
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