# Function Stories

**Directions: Read each story and sketch a graph the represents the phenomenon in the story. Be sure to label axes and indicate a scale. Then, determine which family of functions your sketch belongs to. Explain your reasoning.**

1. During a certain song, the volume of the song decreases steadily from 10 decibels to 1 decibel during one minute and then increases back to 10 decibels during the next minute.
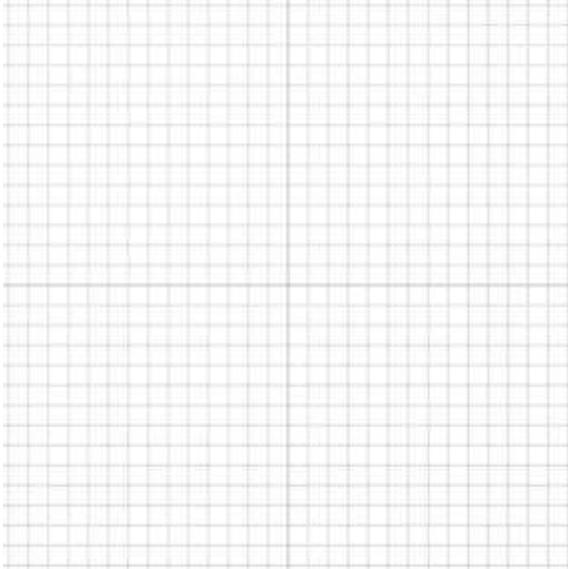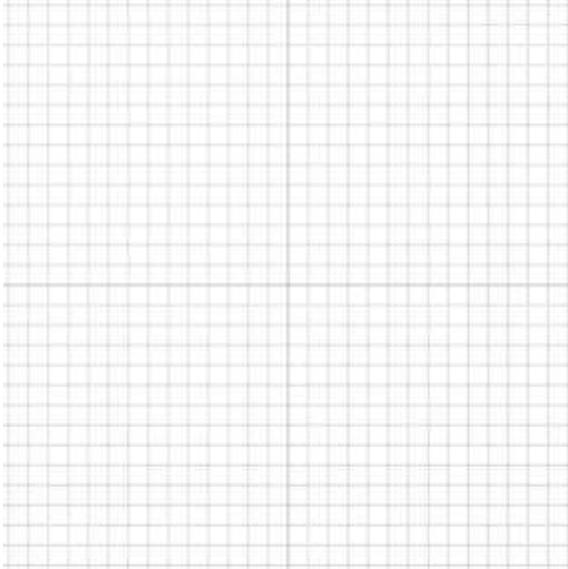
FAMILY OF FUNCTIONS AND REASONING

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2. When a ball is thrown up, into the air from ground level, it starts to slow down as it travels upwards. At a height of 20 ft., it begins to fall. As it falls, it speeds up (due to gravity) until it hits the ground 10 seconds after it was thrown.
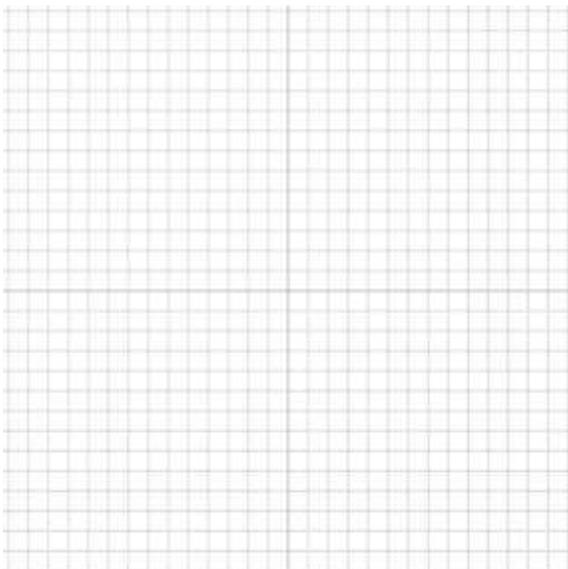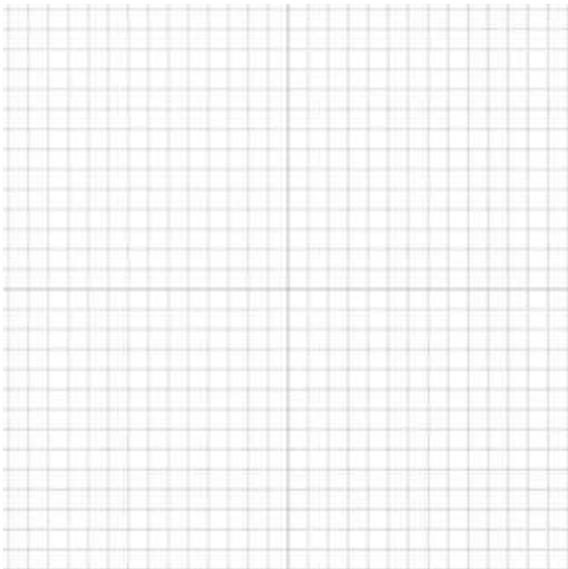
FAMILY OF FUNCTIONS AND REASONING

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3. A glass of cold water is placed outside on a hot day. After some time, you start to measure the temperature of the water each hour and notice a pattern. The temperature of water, which starts at 60° F, rises 5° in the first 2 hours. It takes 4 hours for the temperature to rise another 5°, 8 hours to rise the next 5°, 16 hours to rise the next 5°, and so on. (Consider what may have happened to the temperature before you started recording.)

FAMILY OF FUNCTIONS AND REASONING

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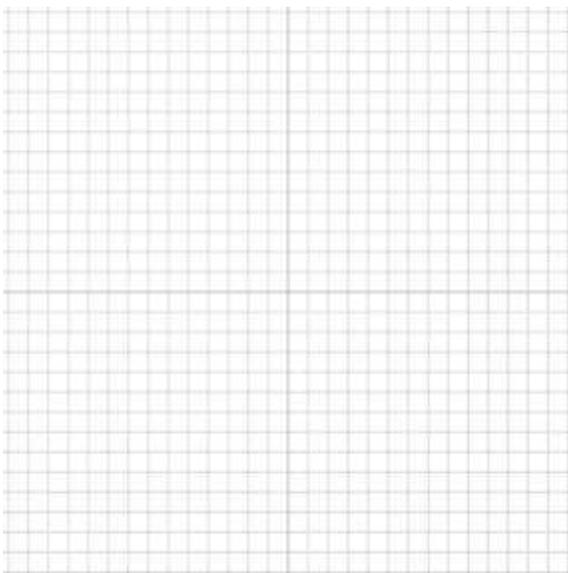_____

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4. When a space shuttle is launched by NASA, the rockets give the shuttle an initial thrust that accelerates the space shuttle very quickly. However, due to gravity, the space shuttle starts to slow down and almost stops rising until booster rockets are fired to help break the shuttle free of Earth's gravitational pull at a height of 60 miles.

FAMILY OF FUNCTIONS AND REASONING

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5. A 5 ft. tree was planted at the school 16 years ago. The tree's height doubled in the first year. Then, it took 3 more years for the tree to reach a height of 15 ft. Five years after that, the tree was 20 ft. tall. This year, the tree was measured at 25 ft.
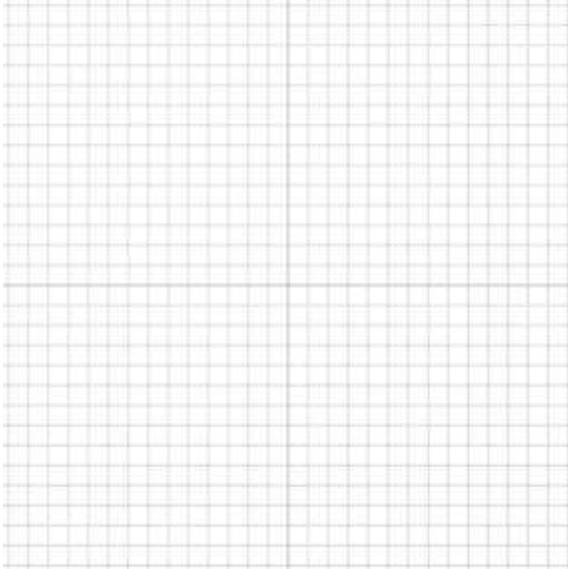
FAMILY OF FUNCTIONS AND REASONING

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6. Earthquakes are measured on a special scale called the Richter scale. On this scale, an earthquake with just enough energy to be detected is given a Richter scale value of 1.0. This is called a threshold earthquake. A 2.0 magnitude earthquake has 10 times the energy of a 1.0 magnitude earthquake. "Minor" earthquakes that are (rated 4.0) have 1000 times the energy as a threshold quake, and "Major" earthquakes (rated at 8.0) have 10,000,000 times the energy as a threshold earthquake.

FAMILY OF FUNCTIONS AND REASONING

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