Maths in every day life essay sample

Otherwise, r can be found as a ratio of the birth rate to the death rate. If we let $1 + r = b$, the base of the exponential expression, the function becomes $p = p_0 b^t$. An alternative version of this relation describes the time it would take for the population to reach a given amount p: $t = \log_b(p / p_0)$. Students will use both functions to predict the future global population, provided the current growth rate or 1. 3% (Abbott, 2004). This relation will also be used to find out how long it will take the global population to reach a certain level. Tsunami

A tsunami is a high-speed sea wave of seismic origin created by " an underwater earthquake, landslide, or volcanic eruption"(Johnston, 2001). A shallow water wave is a water wave in which the wavelength is larger than the water height, or ocean depth (Banks, 1998). Since humans are concerned with a tsunami primarily at the shore, where the water is not deep, tsunami are explored as a shallow water wave. That is, people are most concerned with the height of a wave as it hits shore. Tsunami will be discussed in the context of water depth, wave velocity, period, wavelength and energy. The wavelength, velocity and period of a shallow ocean wave are related by the direct variation equation $L = CT$, where L = wavelength, C = velocity, and T = period (Bryant, 2005). This is an example of a linear relation between velocity and period. Period or velocity may also be expressed as a ratio of the other two quantities. Students may be asked to find any one of the three variable quantities, provided the other two.

A square root function that models tsunami velocity as a function of water depth is $v = (gD)^{1/2}$, where $g = 9. 8 m/s^2$ and D = water depth. Alternatively, this can be a quadratic model to find the depth of water if the wave velocity

is known: $D = v^2 / g$ (Abbott, 2004, Banks, 1998). The energy of a water wave, particularly a tsunami, can be modeled as a function of wave height and wavelength, using the following quadratic equation: $E_W = 0.125pgH^2L$, where E_W = wave energy in joules, p = density of water, g = 9.8m/s2, H = wave height, L = wavelength (Abbott, 2004). Alternatively, wave height can be modeled as a square root function of wave energy and wavelength: $H = 2(2E_W / (pgL)^{1/2})$. Students will use this relation to find both water depth and velocity. They should also be asked to compare the energy of shallow waves of different heights and wavelengths, in order to differentiate between linear and quadratic relationships. This is probably most easily found through using a tabular representation of the relation, then comparing the respective energies.