S.4 MATHEMATICS

TRIAL ITEMS 2024

Instructions: Attempt all   Time: 1 hour

RATIOS AND PROPORTIONS

As a diver descends, the increase in water pressure varies directly as the increase in depth below the water surface. However, the constant of variation is smaller in fresh water than in salt water. For example, at 80 feet below the surface of a typical fresh water lake, the pressure is 34.64 Newtons greater than the pressure at the surface. In a typical ocean, where water is salty, the pressure at 80 feet is 35.6 Newtons greater than the pressure at the surface.

Tasks:

a) Find the constant of variation and the equation of direct variation for the increase in pressure in a typical fresh water lake.

b) Find the increase in pressure at 100 feet below the surface of a lake.

c) Find the constant of variation and equation of direct variation for the increase in pressure for a typical ocean.

d) Find the increase in pressure at 100 feet below the surface of a lake.

COMPOSITE FUNCTIONS

A certain factory that makes picture frames has two functions that they follow in the course of production. The function $C(x) = 4x + 850$ closely approximates the cost of a daily production run of x picture frames. The number of picture frames produced is represented by the function $x(t) = 9t$, where t is the time in hours since the beginning of production run.

Tasks:

a) Give the cost of the daily production C as a function of time, t.

b) Find the cost of production run that lasts 5 hours.

c) How many picture frames could be produced in 5 hours.

END

Practice makes perfect