Name:

QUIZ 17 – MATH IB HL

1. (60%) Given the function $D(d) = \dfrac{12 + 6d}{2d - 4} + 6, \quad d \leq 0$ that describes the density of a certain liquid as a function of depth.

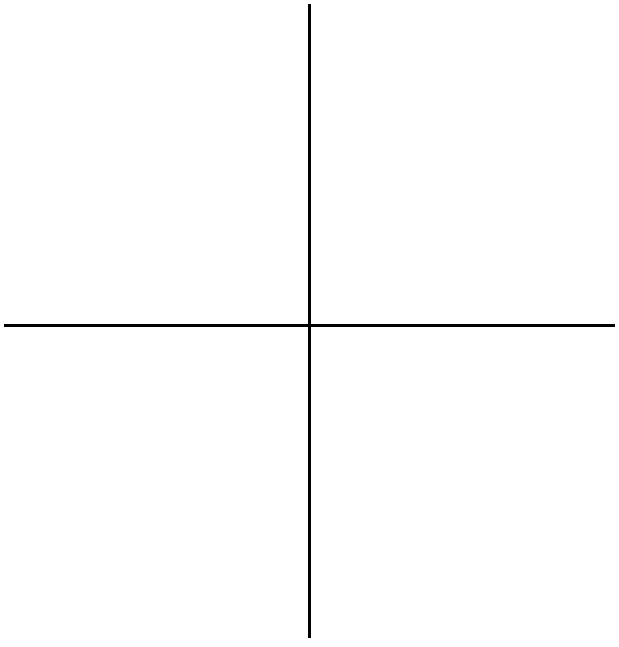
   d is the depth in meters and D is the density in kg/m^3

   a. (10% mark) Find the density of the liquid at the surface.

   b. (25%) Write the function in the form $D(d) = \dfrac{A}{Cd + D} + B$

   c. (15% marks) Find density of the liquid at very large depths. Justify the answer.

   d. (10%) Graph the function in its **domain**.



2. (10%) Vertical asymptotes exist if

_____

3. (10%) Horizontal asymptotes exist if

_____

4. (20%) The following function provides the number of hours a person should sleep (N) as a function of its age t: $N(t) = \frac{4}{(t+a)} + 5$

   a. (7%) It is known that a 8 year old boy needs to sleep 10 hours. Find *a*.

   b. (7%) According to this function "old" people sleep approx. _____ hours (fill the blank)

   c. (6%) According to this model, as we age do we need to sleep more or less? Justify your answer.