9. [9 points] A pharmaceutical company just released a new medication to reduce the cold symptoms in children between 18 months old and 12 years of age. Let $D(z)$ be the dose (in ounces) recommended for a child that is z years old. A table with some values of $D(z)$ is shown below.

z	1.5	3	5	8	10	12
$D(z)$	2	5.2	8.6	11.4	14.5	20.2

a. [3 points] Find a formula for $D(z)$ on $3 \le z \le 5$ assuming it is a linear function in this interval.

Using the points $(3, 5.2)$ and $(5, 8.6)$, we can find the slope $m = \dfrac{8.6 - 5.2}{5 - 3} = 1.7$. Applying the point slope formula for the linear function we get $D(z) = 5.2 + 1.7(z - 3)$.

Answer: $D(z) = $ _____ $5.2 + 1.7(z - 3)$ **or** $1.7z + 0.1$ _____

b. [3 points] Suppose that $D(z)$ is invertible. Give a practical interpretation of the equation

$$D^{-1}(9) = 6.5.$$

Answer: A child whose recommended dose is 9 ounces is six and a half years old.

c. [3 points] Below is the first part of a sentence that will give a practical interpretation of the equation $D'(2) = 1.2$ in the context of this problem. Complete the sentence so that the practical interpretation can be understood by someone who knows no calculus. Be sure to include the appropriate units in your answer.

As the age of an child increases from 2 years to 25 <u>*months*</u>*, the recommended dose* *increases* *by about 0.1 ounces.*