A.REI.D.11: Other Systems 6

1 Which value, to the *nearest tenth*, is the *smallest* solution of $f(x) = g(x)$ if $f(x) = 3\sin\left(\frac{1}{2}x\right) - 1$ and $g(x) = x^3 - 2x + 1$?
1) −3.6
2) −2.1
3) −1.8
4) 1.4

2 A pair of figure skaters graphed part of their routine on a grid. The male skater's path is represented by the equation $m(x) = 3\sin\frac{1}{2}x$, and the female skater's path is represented by the equation $f(x) = -2\cos x$. On the accompanying grid, sketch both paths and state how many times the paths of the skaters intersect between $x = 0$ and $x = 4\pi$.
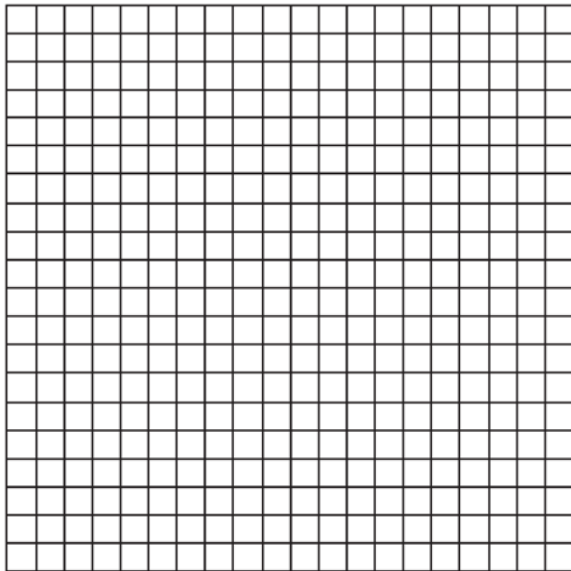

3 The volume of air in an average lung during breathing can be modeled by the graph below.
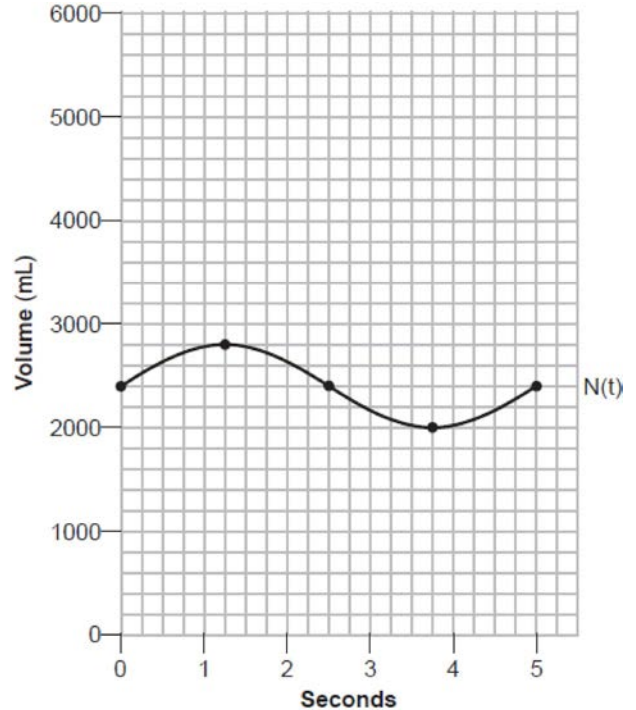
Using the graph, write an equation for $N(t)$, in the form $N(t) = A\sin(Bt) + C$. That same lung, when engaged in exercise, has a volume that can be modeled by $E(t) = 2000\sin(\pi t) + 3200$, where $E(t)$ is volume in mL and t is time in seconds. Graph *at least one* cycle of $E(t)$ on the same grid as $N(t)$. How many times during the 5-second interval will $N(t) = E(t)$?
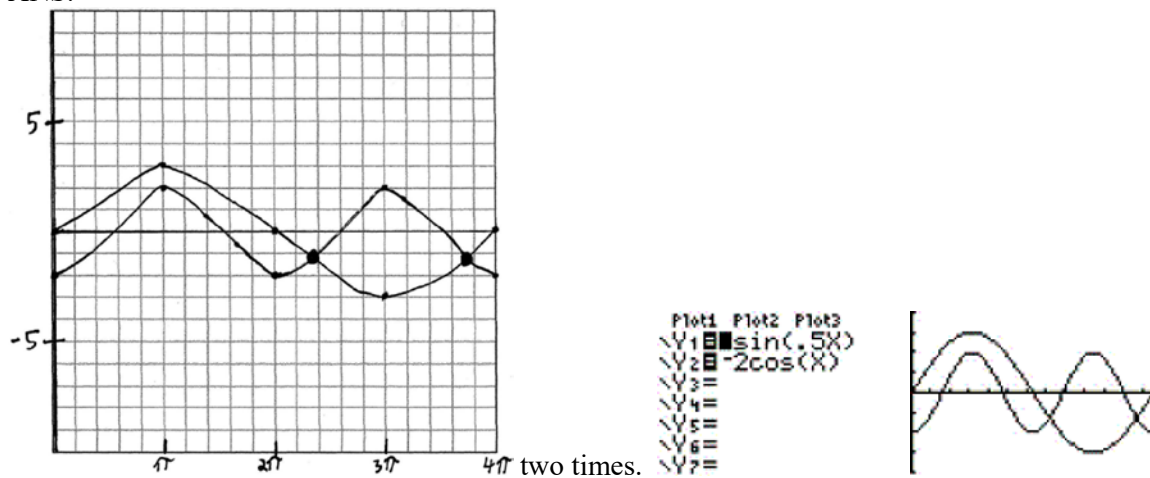
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Answer Section

1 ANS: 2
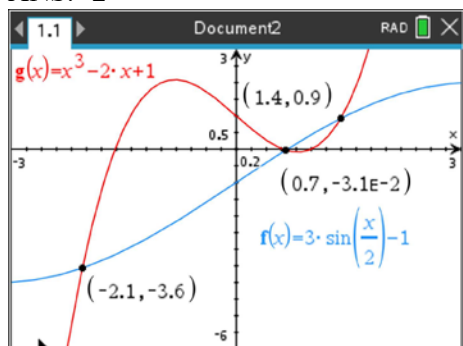
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2 ANS:

4π two times.
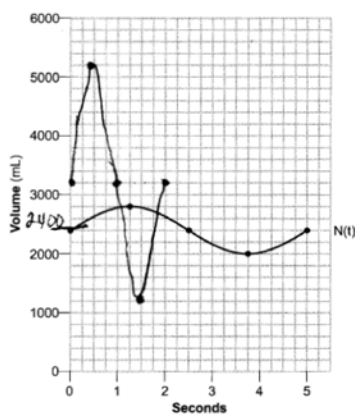
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3 ANS:

$N(t) = 400 \sin\left(\dfrac{2\pi}{5} t\right) + 2400.$ 4 times.

REF: 062337aii