

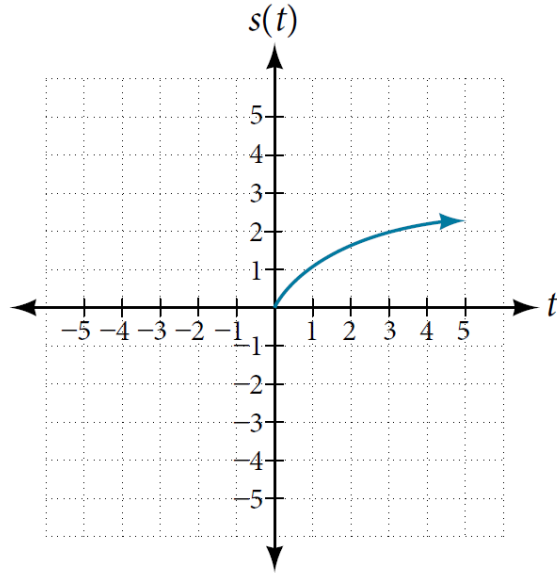
YOUR NAME: _____

George Voutsadakis

Read each problem **very carefully** before starting to solve it. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. **GOOD LUCK!!**

1. [2 points] The function $y = f(x)$ is given by the table below and the function $y = s(t)$ is given by the graph below. Find the following quantities:

x	1	3	4	11	18	21	24
$f(x)$	-5	-2	7	13	4	9	20



(a) $f^{-1}(7) =$

(b) $s^{-1}(2) =$

2. [4 points] Find a formula for $f^{-1}(x)$ if $f(x) = \frac{3x}{x+5}$.

3. [3 points] A line ℓ_1 passes through the points $(-10, -3)$ and $(10, -43)$. Find an equation for the line ℓ_2 that is perpendicular to ℓ_1 and passes through the point $(3, 7)$.
4. [3 points] Jane is a collector of celebrity cards. She has 27 cards currently in her collection. Every month, she can afford adding 9 more cards in her collection.
- (a) Write a model for the number $C(t)$ of cards that Jane will have in her collection t months from now.
- (b) According to this model, how long will it take Jane to have a total of 270 cards in her collection? Please show all your steps and give your answer in a complete sentence.