

Test: Review of Functions and Lines

Academic Integrity: I affirm that the work and answers on this test are my own and that I have upheld the highest standards of academic integrity.

Printed Name _____ Signature _____

Provide a complete solution for each of the following items. Your solution should not only contain a correct answer and supporting work, but should also indicate your reasoning and employ correct notation. Make sure your work is done *neatly*!!

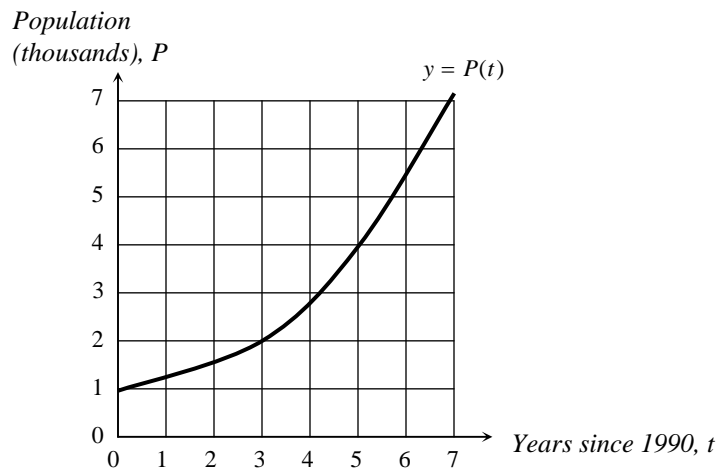
1) Write an equation for the line that passes through the point $(-2, 3)$ and is perpendicular to the line given by the equation $4x - 3y = 5$. Then graph the resulting line. Be sure to clearly indicate the x - and y -intercepts on the graph.

2) Given $f(x) = x^3 - x$ and $g(x) = 15x$, find the values of x for which $f(x) = g(x)$.

3) Evaluate $h(-3)$, $h(-1)$, and $h(-2 - x^2)$ given that $h(t) = \begin{cases} 3 - 5t, & t < -\frac{3}{2} \\ 4t^4 + 7, & t \geq -\frac{3}{2} \end{cases}$

4) Determine the domain of the function defined by $h(x) = \frac{\sqrt{3 + 5x - 2x^2}}{x - 1}$.

5) The population, P (in thousands), of Mathville t years after 1990 is represented by the graph shown, where $y = P(t)$. Approximate $P(2)$. Interpret your answer in the context of this application.



6) Your field research indicates that your test site contained 153 globemallow plants in 2001 and 237 globemallow plants in 2003.

- Assuming a linear relationship, write an equation for the number of globemallow plants as a function of the year.
- Interpret the slope of your equation in the context of this application.
- According to your linear model (equation), how many globemallow plants existed at the test site in 2005?