Function Workout
College Algebra

1. What is the domain of $g(x)=\sqrt{x-3}$? Find $g(12)$

2. What is the domain of $g(x)=x^2-3x+5$? Find $g(-2)$

3. What is the domain of $g(x)=\dfrac{x-2}{\sqrt{4-x}}$? Find $g(4)$, $g(3)$, and $g(13)$

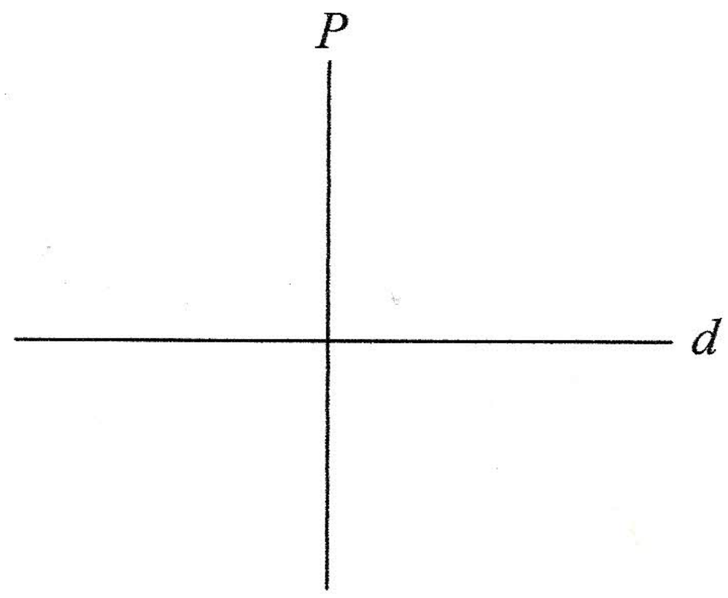
4. What is the domain of $g(x)=\dfrac{x}{1+x^2}$? Find $g(-1)$ and $g(0)$.

5. Given the function $f(x)=-5x+6$, find the following:

   a) $f(-2)$
   b) $f(a+2)$

6. The pressure 100 ft beneath the ocean's surface is approximately 4 atm (atmospheres). At a depth of 200 ft, the pressure is about 7 atm.

   a) Write a linear function that expresses pressure, *P,* as a function of depth, *d,* below the ocean's surface. Sketch it's graph on the system below.



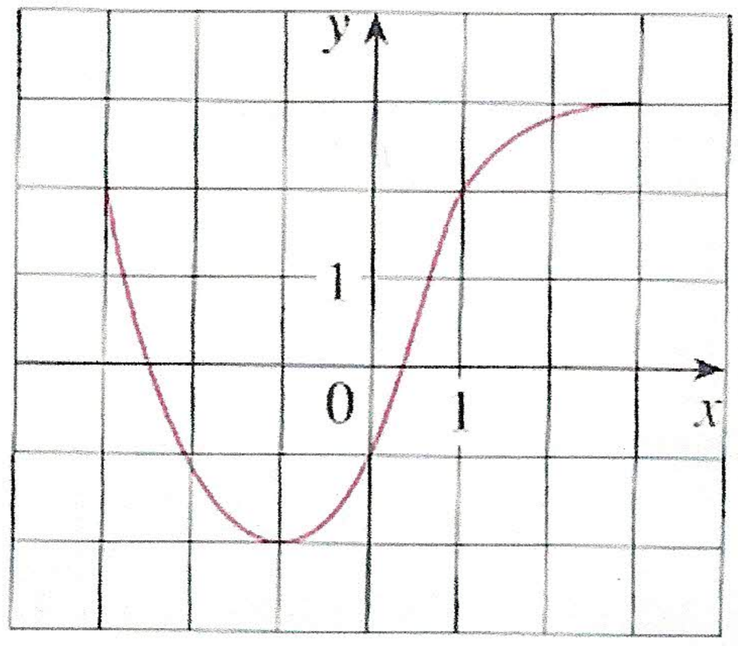
   b) Interpret the meaning of $P(0)$.

7. For the problem above,

   (a) Interpret the meaning of *the slope.* Be sure to use appropriate units.

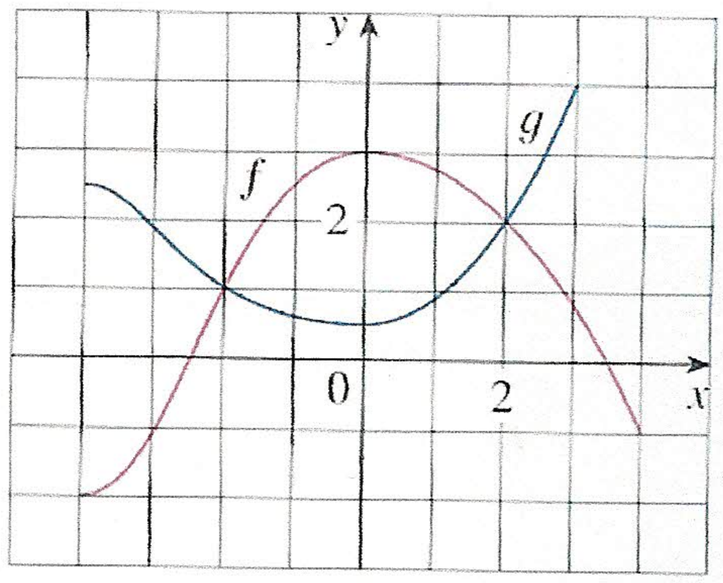
   (b) Find $P(300)$.

8. The graph of a function f is shown below. Find the following:



(a) $f(-1)$
(b) the domain of f. (use interval or set notation, your choice)
(c) estimate the values of x for which $f(x) = 0$
(d) the range of f. (use interval or set notation, your choice)

9. The graphs of f and g are shown below. Estimate the following:



(a) The x-intercept(s) and y-intercept of f.
(b) The value(s) of x for which $f(x) = g(x)$
(c) The interval(s) where g is increasing.
(d) The interval(s) where $g > f$.

10. The function $f(n) = PV \bullet \dfrac{i}{1-(1+i)^{-n}}$ gives the monthly payment amount for a mortgage, where PV = the amount loaned, i = the yearly rate of interest divided by 12 and n = number of monthly payments.

Problem: Suppose Carlos borrows 167,000 for a new home at a yearly interest rate of 5.5% compounded monthly. What are his monthly payments if he pays the loan out over 30 years? 15 years? 10 years? How much interest is saved if he decides to go with the 15 year note as opposed to the 30 year note?