

Math 0120 Homework_02 is due : 08/29/2012 at 02:05pm EDT.

Reference: Berresford, Sections 1.3, 1.4

1. (1 pt) You buy a saguaro cactus 7 feet high and it grows at a rate of 0.6 inches each year. Express its height h , in inches, as a function of time t , in years, since the purchase. Enter your answer as an equation with h on the left side, and an expression involving t on the right.

2. (1 pt) The temperature of the soil is 26°C at the surface and decreases by 0.02°C for each centimeter below the surface. Express temperature T , in degrees Celsius, as a function of depth d , in centimeters, below the surface. Enter your answer as an equation with T on the left side, and an expression involving d on the right.

3. (1 pt) Suppose $f(x) = \frac{6}{5-x^3}$.

(a) Calculate exactly the value of y when $y = f(3)$. Simplify your answer as much as possible. Enter a fraction instead of a decimal.

$y =$ _____

(b) Calculate exactly the value of x when $f(x) = 6$. Simplify your answer as much as possible.

$x =$ _____

4. (1 pt) Use a graph to find the range of the function $y = f(x) = x^2 - 25$ on the domain $-2 \leq x \leq 3$.

Range: _____

5. (1 pt) Find the domain and range of the function $y = f(x) = (x-5)^2 + 5$.

Domain: _____

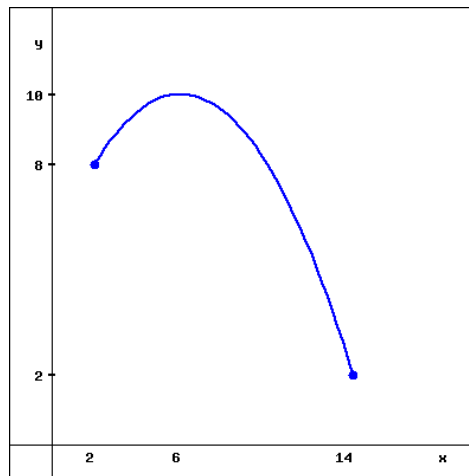
Range: _____

6. (1 pt)

Estimate the domain and range of the function $y = f(x)$ graphed in the figure. Assume the entire graph is shown.

(a) What is the domain of $f(x)$? _____

(b) What is the range of $f(x)$? _____



(Click graph to enlarge)

7. (1 pt)

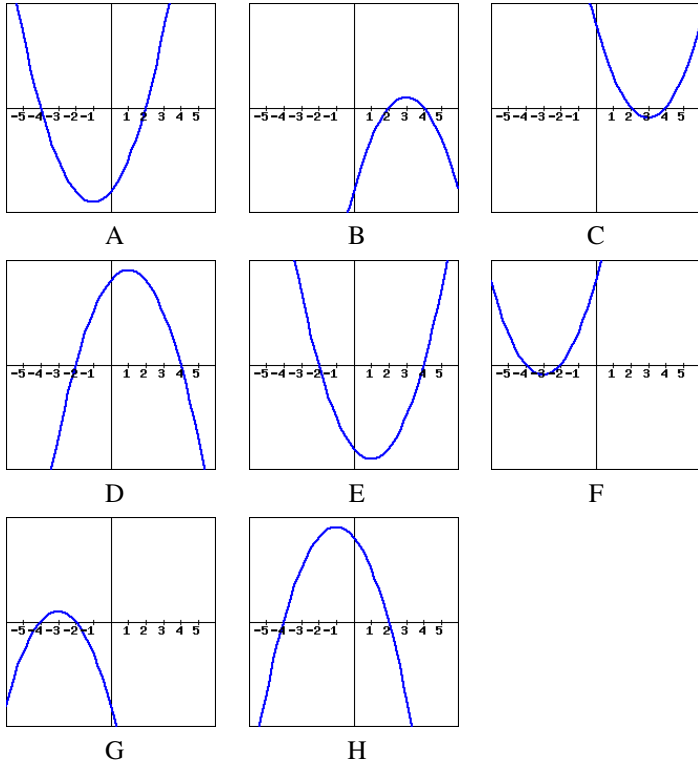
Match each equation with its graph.

$y = -2(x+4)(x+2)$

$y = -2(x-4)(x-2)$

$y = -2(x-4)(x+2)$

$y = 2(x+2)(x+4)$



(Click on a graph to enlarge it)

8. (1 pt) Let $f(t)$ be the number of men and $g(t)$ be the number of women in Canada in year t . Let $h(t)$ be the average income, in Canadian dollars, of women in Canada in year t .

In this problem, you do not have explicit equations for the functions $f(t)$, $g(t)$, or $h(t)$, so you are not able to write explicit equations to represent these functions. Your answers should be expressions obtained by adding, subtracting, multiplying, dividing, and/or composing the functions $f(t)$, $g(t)$, and $h(t)$.

(a) Find an expression for the function $p(t)$ which gives the total number of people in Canada in the year t .

$p(t) =$ _____

(b) Find an expression for the total amount of money $m(t)$ earned by Canadian women in the year t .

$m(t) =$ _____

9. (1 pt) Bea T. Howen, a sophomore college student, lost her scholarship after receiving a D in her "Music Appreciation" course. She decided to buy a snow plow to supplement her income during the winter months. It cost her \$6250.00. Fuel and standard maintenance will cost her an additional \$7.75 for each hour of use.

Find the cost function $C(x)$ associated with operating the snow plow for x hours.

$C(x) =$ _____

If she charges \$39.00 per hour write the revenue function $R(x)$ for the amount of revenue gained from x hours of use.

$R(x) =$ _____

Find the profit function $P(x)$ for the amount of profit gained from x hours of use.

$P(x) =$ _____

How many hours will she need to work to break even? _____ hours

10. (1 pt) Let $f(x) = x + 1$ and $g(x) = \frac{1}{x+1}$. Find the following compositions.

1. $(f \circ f)(x) =$ _____
2. $(f \circ g)(x) =$ _____
3. $(g \circ f)(x) =$ _____
4. $(g \circ g)(x) =$ _____

11. (1 pt) Let $f(x) = 7 + 4x - x^2$. Find the difference quotient $\frac{f(4+h) - f(4)}{h}$. Simplify your answer.

Answer: _____