Practice Problems for Math Success

Functions and Function Notation

These **practice problems** are designed to help you **prepare for our course exams** and **assess your understanding** of the course material at the expected level. Aim to complete them **in class, during tutoring, office hours, or on your own**, and try to solve them **without notes or a calculator**, just like on the **actual exams**. Remember, **practice makes perfect**, so don't hesitate to **ask for help** if you get stuck.

1. (a) If you are going to graph $s = f(q)$, which variable goes on the horizontal axis?

   (b) If $9 = f(-3)$, the coordinates of a point on the graph of f are _____.

   (c) If 5 is a solution to the equation $f(q) = 6$, _____is a point on the graph of f.

2. Suppose $Q = h(g)$ is the amount of heating oil (in thousands of gallons) used on an average day by g apartments (in thousands) in the Hudson Heights section of New York City.

   In terms of the problem, what do each of the following expressions represent?

   (a) $h(300) = 17$.

   (b) $1.4h(g)$.

   (c) $h(g) = 50$.

3. A national park contains foxes that prey on rabbits. The table below gives the two populations, F and R (**in thousands**), over a 12 month period, where $t = 0$ means January 1, $t = 1$ means February 1, and so on.

t (months)	0	1	2	3	4	5	6	7	8	9	10	11
R (rabbits)	10.00	7.50	5.67	5.00	6.67	8.50	9.00	11.50	14.23	15.00	14.33	12.50
F (foxes)	1.50	1.43	1.25	1.00	0.75	0.57	0.50	0.57	0.75	1.00	1.25	1.43

(a) Is t a function of R?

(b) Is R a function of F?

(c) Evaluate $R(4)$ and interpret in the context of this problem.

(d) Solve $F(t) = 0.75$, for all values of t and interpret in the context of this problem.

4. The table below shows the number of calories used per minute as a function of body weight for three sports.

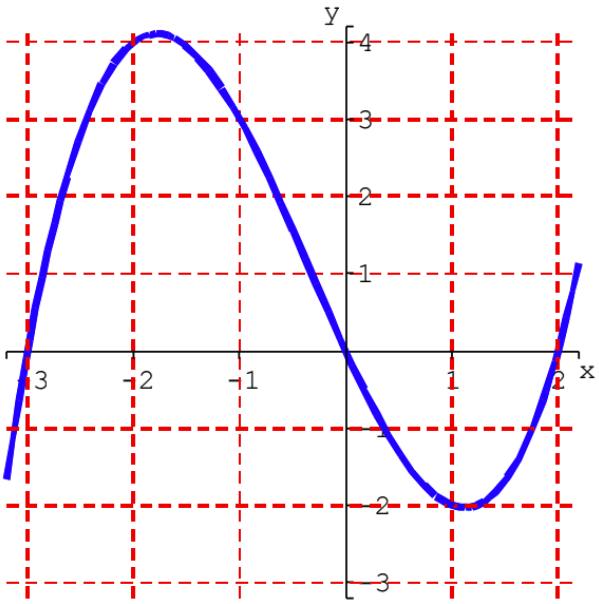
Activity	100 lb	120 lb	150 lb	170 lb	200 lb	220 lb
Walking (3 mph)	2.7	3.2	4.0	4.6	5.4	5.9
Bicycling (10 mph)	5.4	6.5	8.1	9.2	10.8	11.9
Swimming (2 mph)	5.8	6.9	8.7	9.8	11.6	12.7

(a) The number of calories that a 170 lb person uses in one half-hour of walking = _____.

(b) Who uses more calories, a 120-lb person swimming for one hour or a 220-lb person bicycling for a half-hour?

(c) Does the number of calories used by a person swimming increase or decrease as weight increases?

5. Let $p(x)$ be defined by the graph shown below.



Answer the following questions.

(a) Evaluate $p(-1)$.

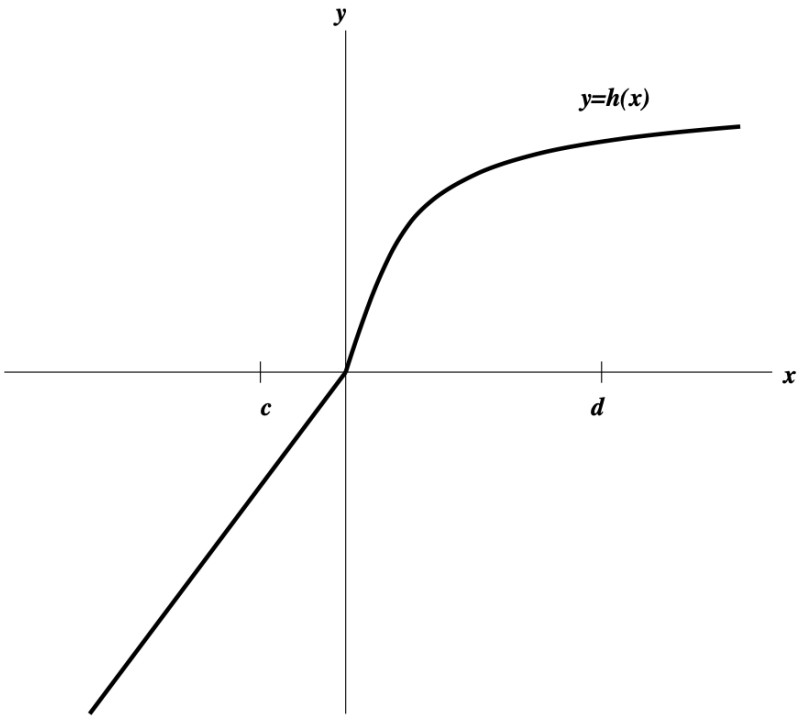
(b) Evaluate $-p(1)$.

(c) Solve $p(x) = 0$.

(d) Is $p(-\frac{3}{2})$ positive or negative?

(e) How often does the line $x = -1$ intersect the graph of p?

6. On the graph below, the values of c and d are labeled on the x-axis.



Locate and label the following quantities clearly on the graph.

(a) $h(c)$.

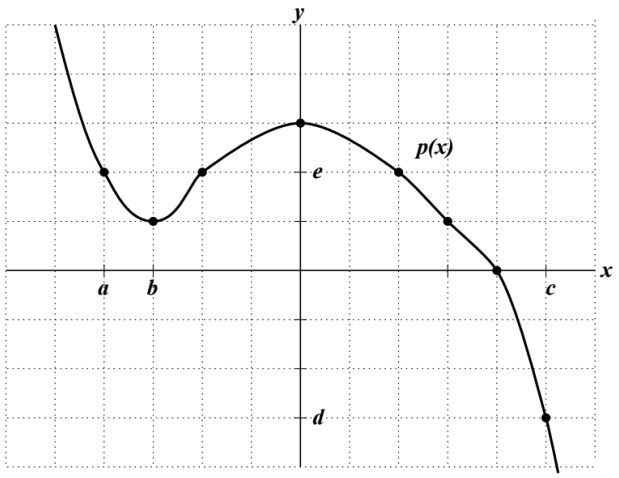
(b) $h(d)$.

(c) $h(-d)$.

(d) $h(c+d)$.

(e) $h(d)-h(c)$.

7. Let $p(x)$ be defined by the graph shown below. Assume that the dotted vertical and horizontal lines are equally spaced.



Circle **all** correct choices. There may be more than one correct choice.

(i) $b =$

d $\quad -c$ $\quad \frac{3}{4}a$ $\quad \frac{4}{3}a$ $\quad -\frac{3}{5}c$ $\quad \frac{5}{3}c$

(ii) $d =$

$p(c)$ $\quad -\frac{3}{2}e$ $\quad -\frac{2}{3}e$ $\quad -p(0)$ $\quad \frac{2}{3}e$ $\quad \frac{3}{2}e$

(iii) $p(0) =$

d $\quad e$ $\quad -d$ $\quad -e$ $\quad \frac{2}{3}e$ $\quad \frac{3}{2}e$

(iv) $p(-b) =$

e $\quad -d$ $\quad -e$ $\quad \frac{1}{3}d$ $\quad \frac{1}{2}e$ $\quad -\frac{1}{2}e$

(v) If $p(x) = e$, then x could be

a $\quad c$ $\quad -\frac{3}{5}c$ $\quad -b$ $\quad -\frac{1}{2}a$ $\quad \frac{2}{3}b$