

Lesson 1 Practice Problems

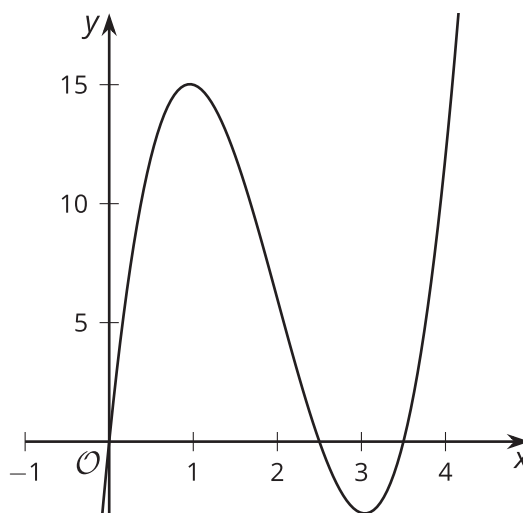
1. A rectangular schoolyard is to be fenced in using the wall of the school for one side and 150 meters of fencing for the other three sides. The area $A(x)$ in square meters of the schoolyard is a function of the length x in meters of each of the sides perpendicular to the school wall.

a. Write an expression for $A(x)$.

b. What is the area of the schoolyard when $x = 40$?

c. What is a reasonable domain for A in this context?

2. Noah finds an expression for $V(x)$ that gives the volume of an open-top box in cubic inches in terms of the length x in inches of the cutout squares used to make it. This is the graph Noah gets if he allows x to take on any value between -1 and 5.



a. What would be a more appropriate domain for Noah to use instead?

b. What is the approximate maximum volume for his box?

3. Mai wants to make an open-top box by cutting out corners of a square piece of cardboard and folding up the sides. The cardboard is 10 centimeters by 10 centimeters. The volume $V(x)$ in cubic centimeters of the open-top box is a function of the side length x in centimeters of the square cutouts.

a. Write an expression for $V(x)$.

b. What is the volume of the box when $x = 3$?

4. The area of a pond covered by algae is $\frac{1}{4}$ of a square meter on day 1 and it doubles each day. Complete the table.

day	1	2	3	4	5	6
area of algae in square meters						

(From Unit 1, Lesson 2.)

5. Here is a table showing values of sequence p . Define p recursively using function notation.

n	$p(n)$
1	5,000
2	500
3	50
4	5
5	0.5

(From Unit 1, Lesson 6.)

6. The table shows two sloth populations growing over time.

time (years since 1990)	population 1 (thousands)	population 2 (thousands)
0	90.0	39
1	76.5	37
2	65.0	35
3	55.3	33
4	47.0	31
5		
6		
7		
8		

- Describe a pattern in how each population changed from one year to the next.
- These patterns continued for many years. Based on this information, fill in the extra rows in the table.
- On the same axes, draw graphs of the two populations over time.
- Does Population 2 ever equal Population 1? If so, when? Explain or show your reasoning.

(From Unit 1, Lesson 10.)