Lesson 1 Practice Problems

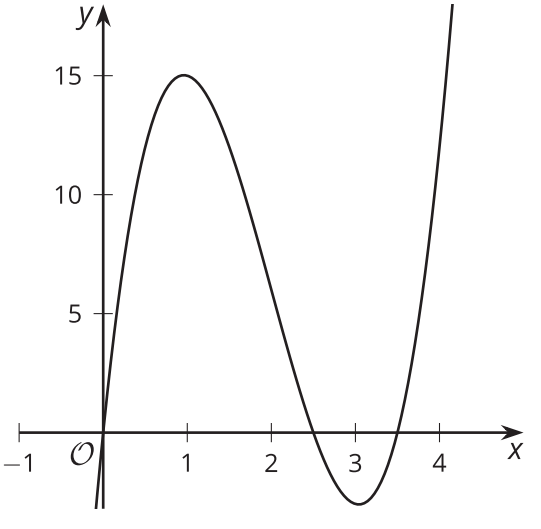
1. A rectangular schoolyard is to be fenced in using the wall of the school for one side and 150 meters of fencing for the other three sides. The area $A(x)$ in square meters of the schoolyard is a function of the length x in meters of each of the sides perpendicular to the school wall.

   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?

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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.)

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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		

a. Describe a pattern in how each population changed from one year to the next.

b. These patterns continued for many years. Based on this information, fill in the extra rows in the table.

c. On the same axes, draw graphs of the two populations over time.

d. Does Population 2 ever equal Population 1? If so, when? Explain or show your reasoning.

(From Unit 1, Lesson 10.)

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