

M201: Function Concepts

Post-Badge Task

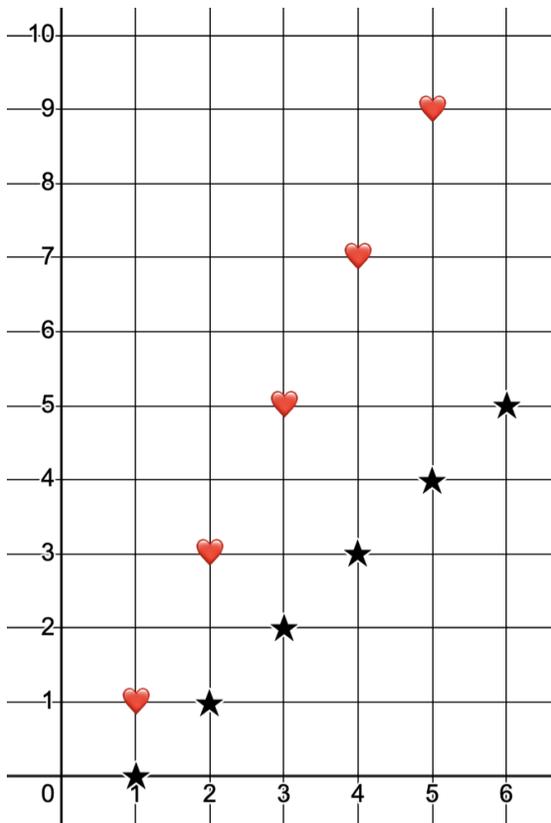
Reflecting on Badge Learning

Now that you have learned more about function concepts, respond to the questions that follow. These are the same questions you responded to before the start of this badge.

The Task

QUESTION 1

The figure shows the graphs of two functions—the Heart and Star functions. The Heart function is defined recursively by $H(1) = 1$, $H(n) = H(n - 1) + 2$. Which choice defines the Star function? How do you know?



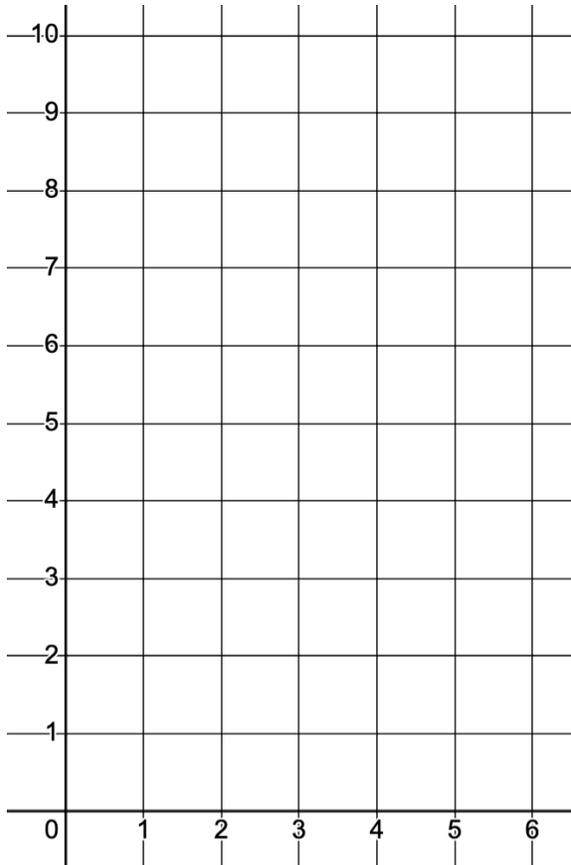
(a) $S(1) = 0$, $S(n) = S(n - 1) + 2$

(b) $S(1) = 0$, $S(n) = S(n - 1) + 1$

(c) $S(0) = 1$, $S(n) = S(n - 1) + 1$

QUESTION 2

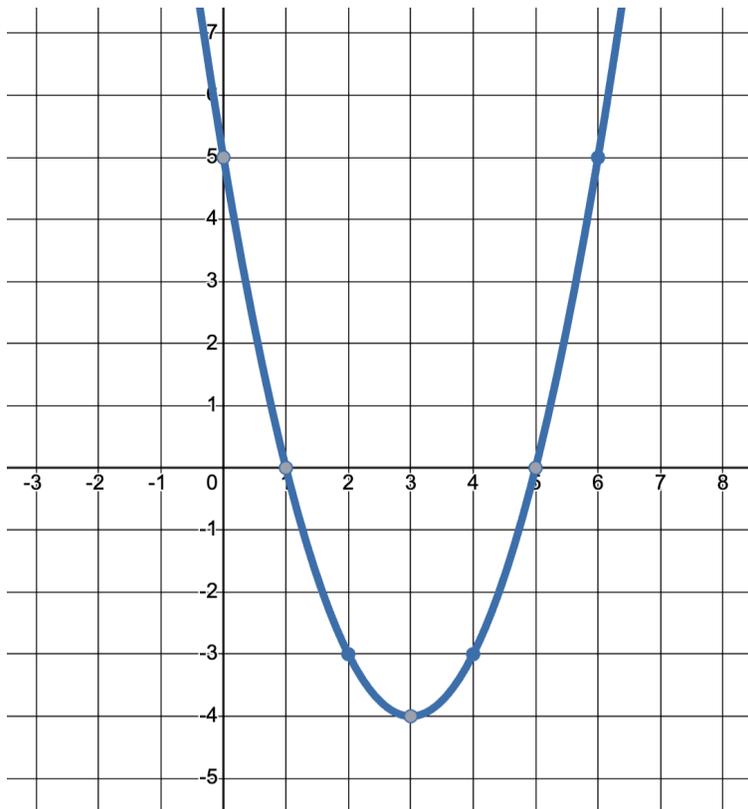
The Dot Function is defined recursively by $D(1) = 8$, $D(n) = D(n - 1) - 0.5$.
Draw the graph of the Dot function on the grid provided.



For which value of n will $D(n) = 0$?
Explain how you determined your answer.

QUESTION 3

The graph of $f(x) = x^2 - 6x + 5$ is shown below. Express the function in factored form and vertex form.



Factored Form:

Vertex Form:

QUESTION 4

Three equivalent forms of quadratic function are given. Determine the vertex, x-intercepts and y-intercept of the graph. Then, draw the graph of the function.



Standard Form:

$$g(x) = x^2 + 2x - 8$$

Factored Form:

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

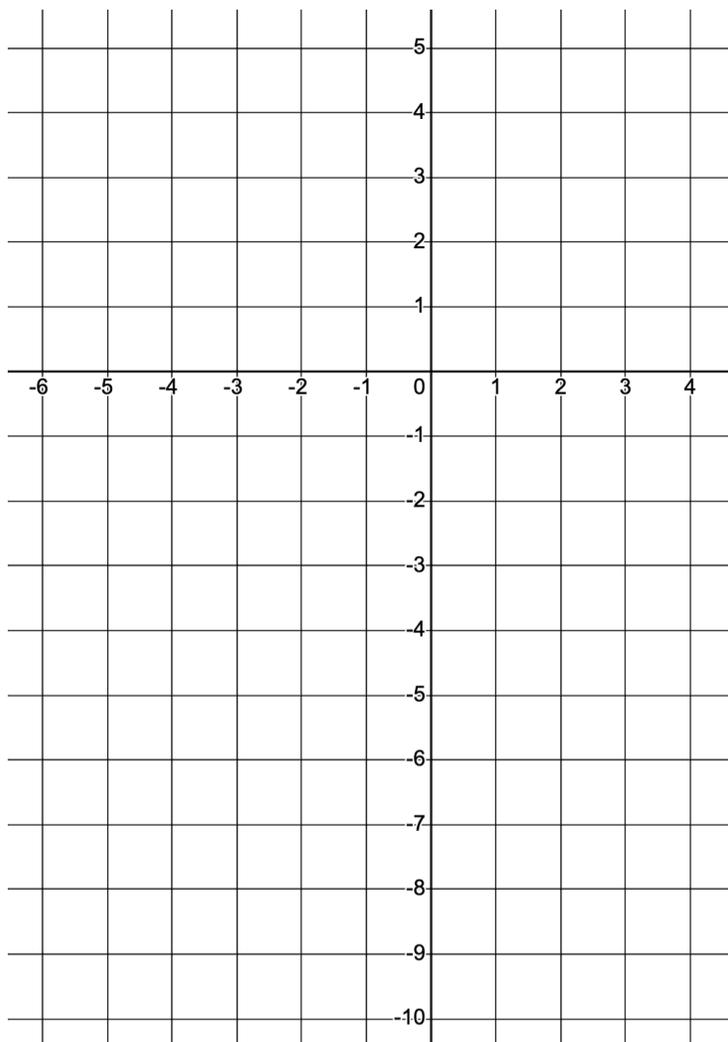
Vertex Form:

$$g(x) = (x + 1)^2 - 9$$

Vertex:

x-intercepts:

y-intercept:

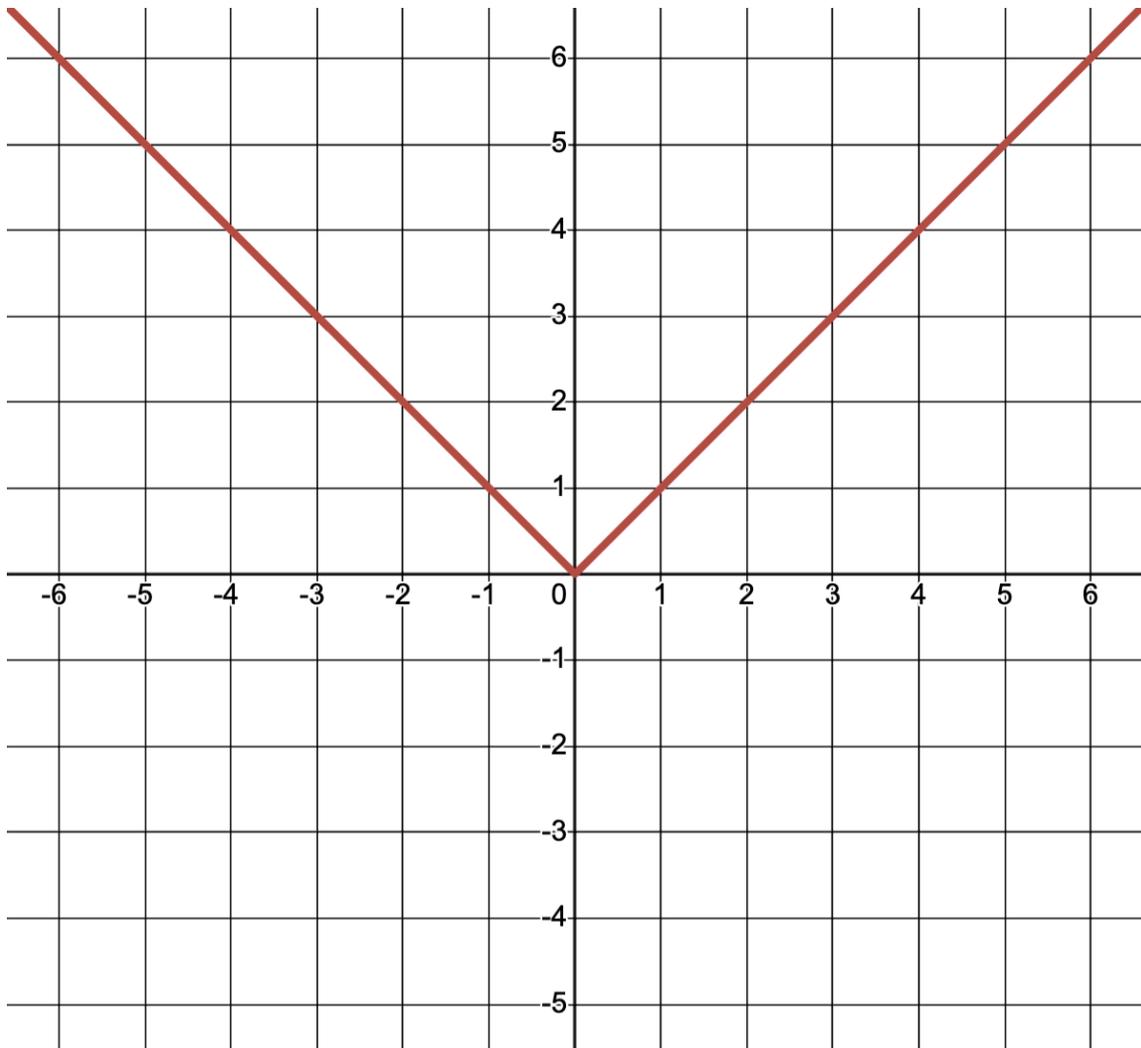


QUESTION 5

The figure shows the graph of $F(x) = |x|$. Draw the graph of each function:

- $y = F(x) + 2$
- $y = F(x + 3)$
- $y = -2F(x)$

Label each function on your graph.



QUESTION 6 What else did you learn that was not reflected in Questions 1-5?



QUESTION 7 Compare your answers to these questions now to your answers from the earlier attempt. What do you notice about your progress?

