**Section A - Selected Response (40 marks)**

**Directions:** Place the letter corresponding to the correct answer on the answer sheet provided.

1. Which of the following is a polynomial function with degree 4?

A) 

B) 

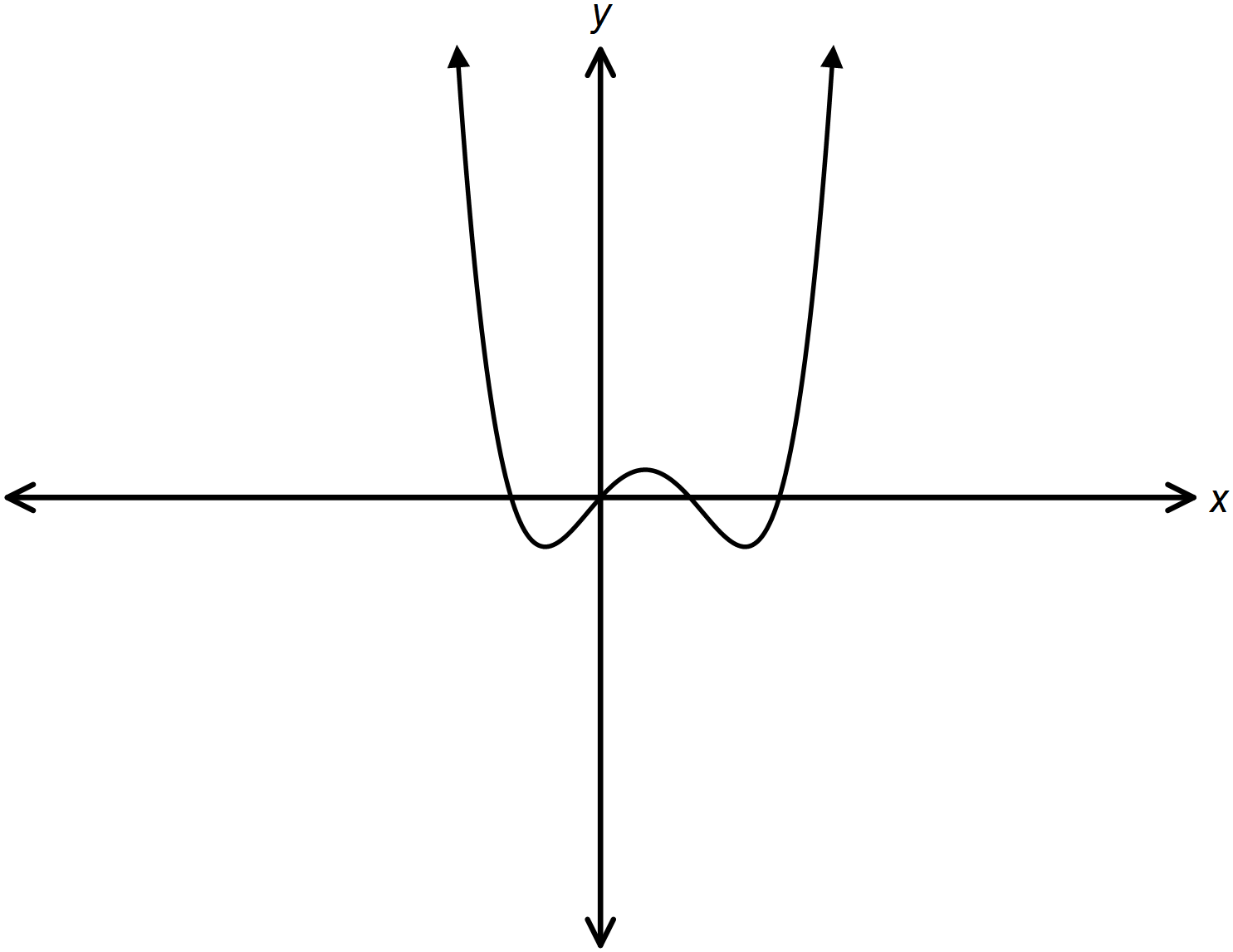
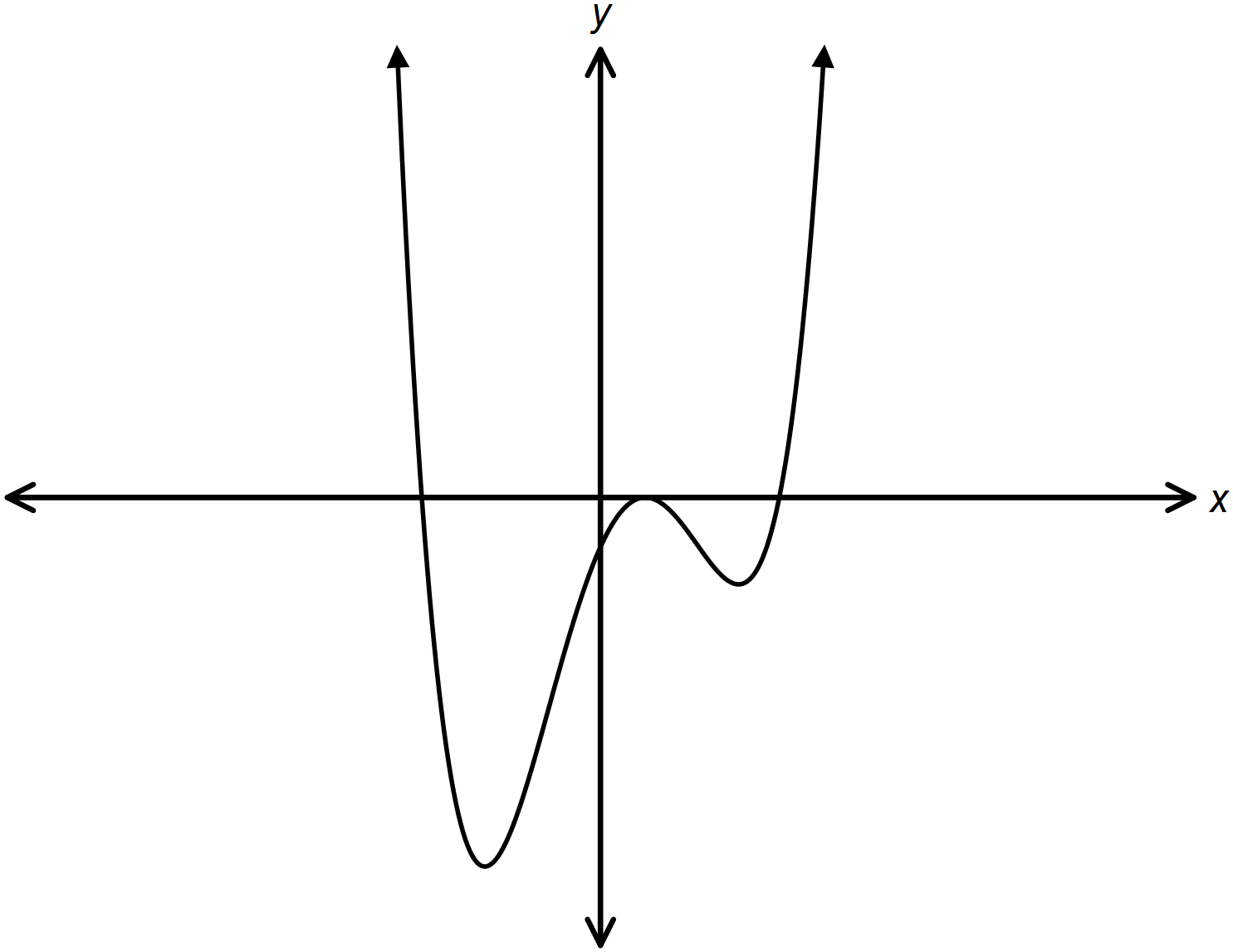
C) 

D) 

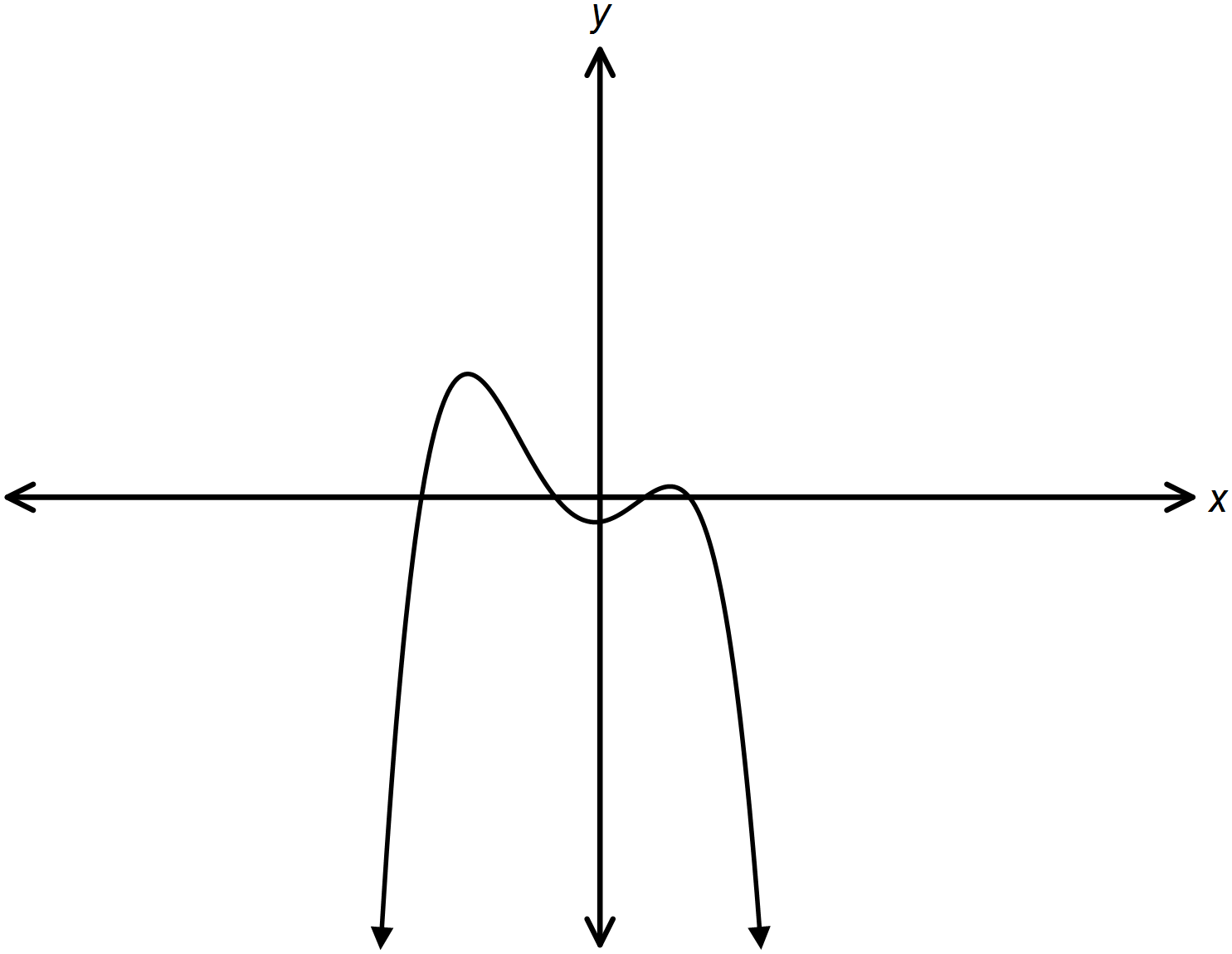
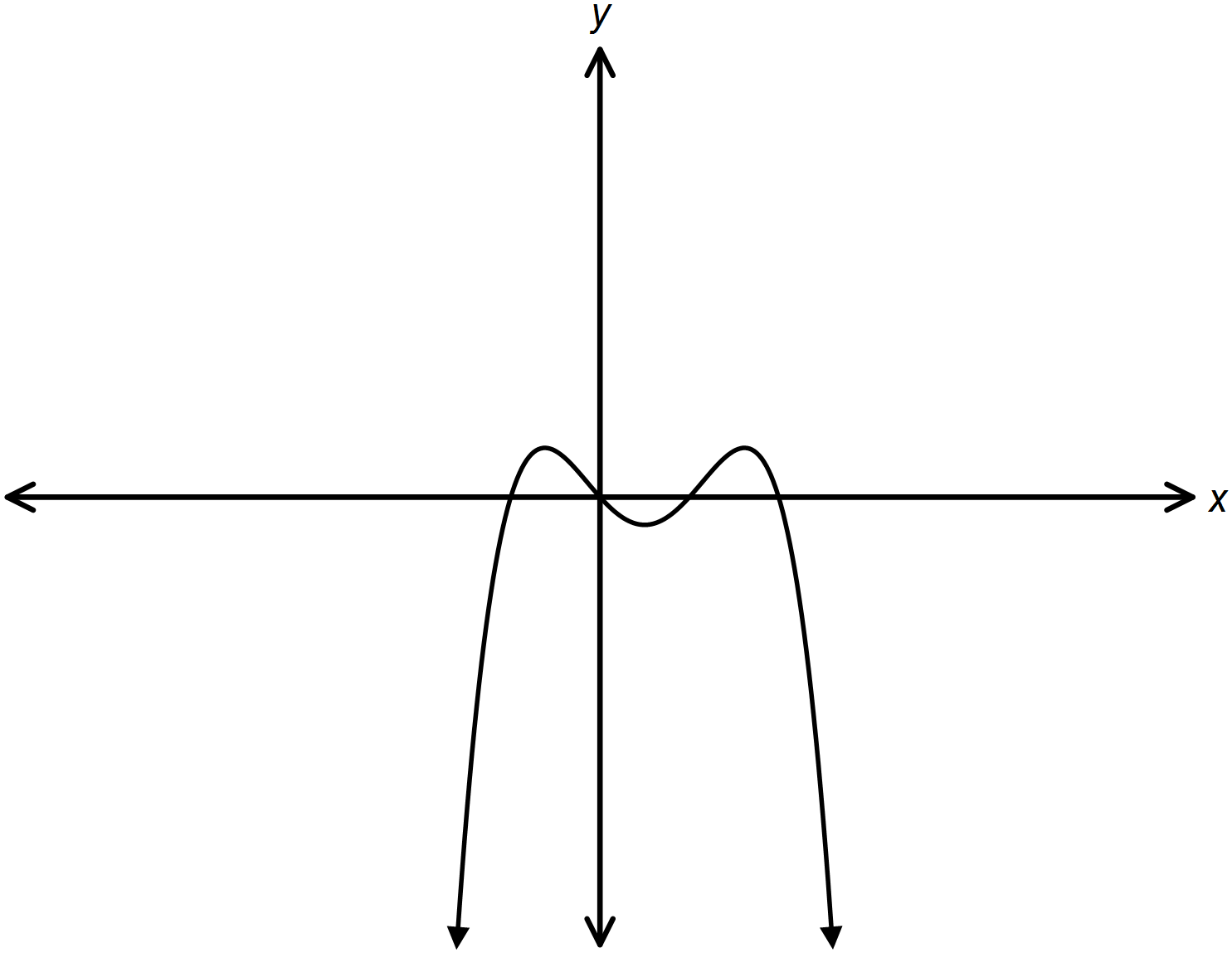
2. Which sketch best represents the quartic function defined by  if  and

?

A) B)



C) D)



3. Which of the following is **true** for the graph of a polynomial function with degree 3?

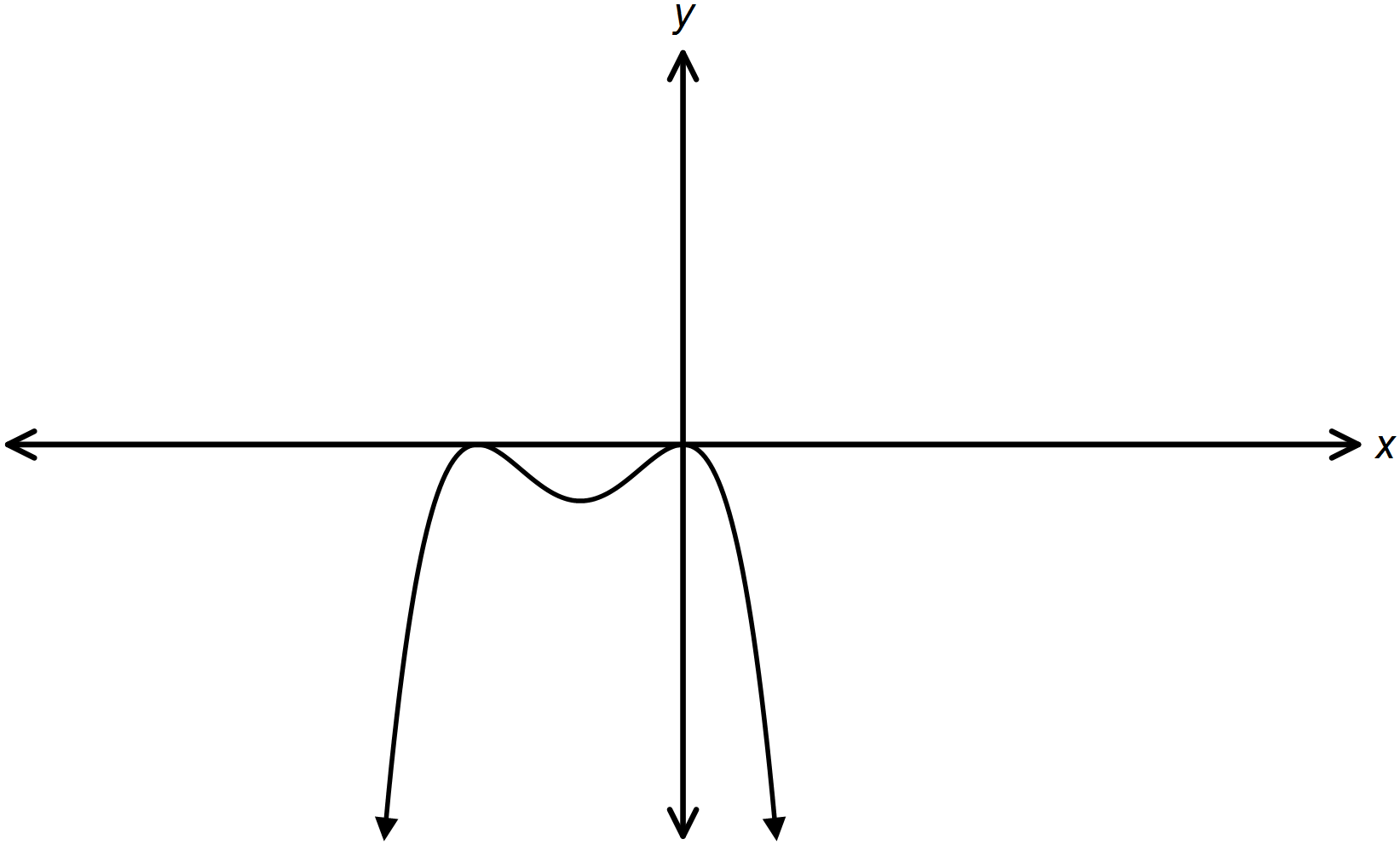
A) There is three turning point.

B) The graph extends down into quadrant III and quadrant IV.

C) There will be a minimum of 0 x intercepts and a maximum of 3.

D) There will be a minimum of 1 x intercept and a maximum of 3.

4. A polynomial function is sketched below, what is equation of this polynomial function?



A) 

B) 

C) 

D) 

5. Which of the following is a binomial factor for the function  ?

A) 

B) 

C) 

D) 

6. What are the *x*-intercepts of the graph of the function ?

A) 

B) 

C) 

D) 

7. A student divided a polynomial function by  and the remainder was -1.

What is the value of k?

A) 1

B) 4

C) 5

D) 6

8. What are the possible integral roots for ?

A) 

B) 

C) 

D) 

9. If  is divided by , which of the following is true?

A) 

B) 

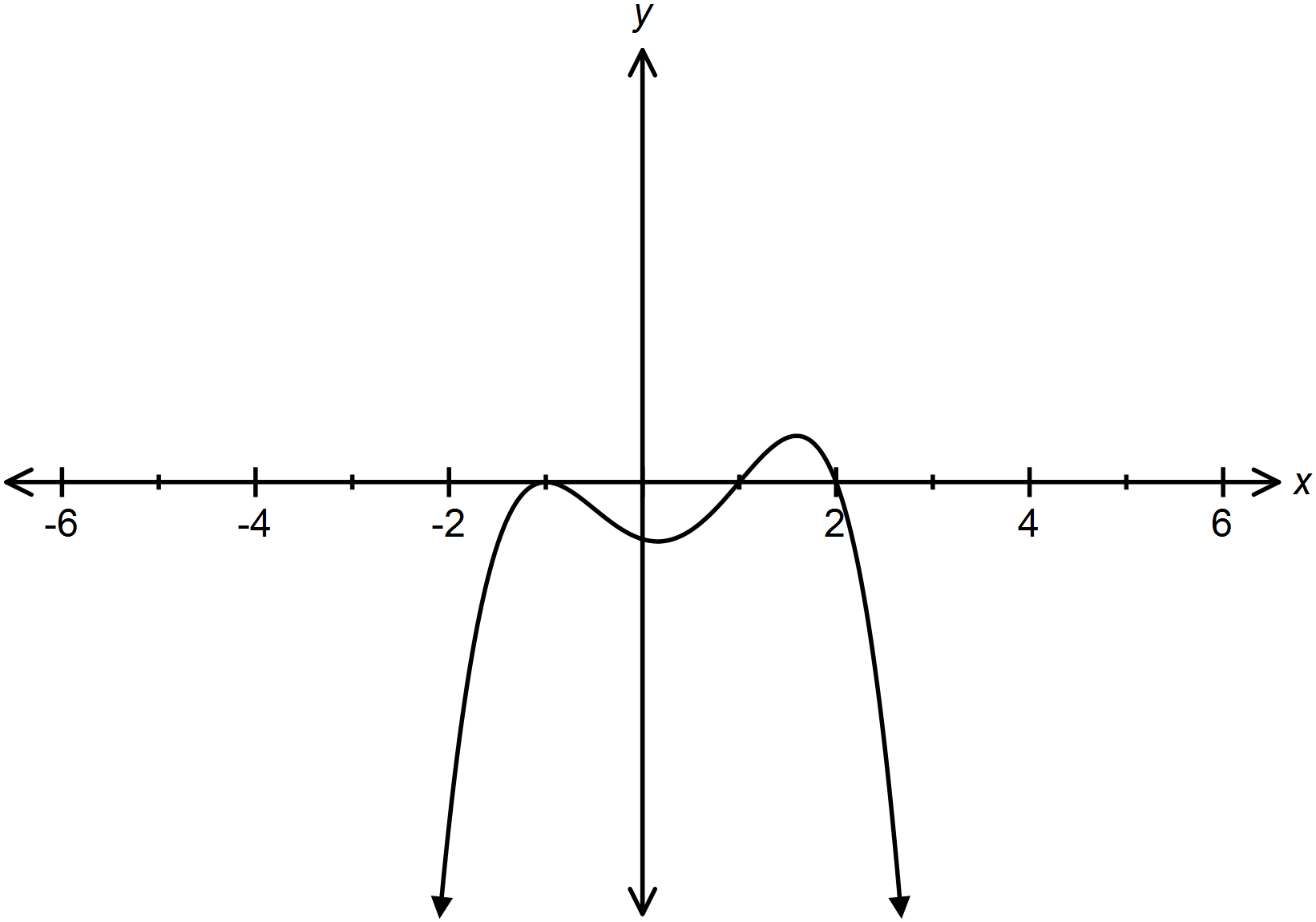
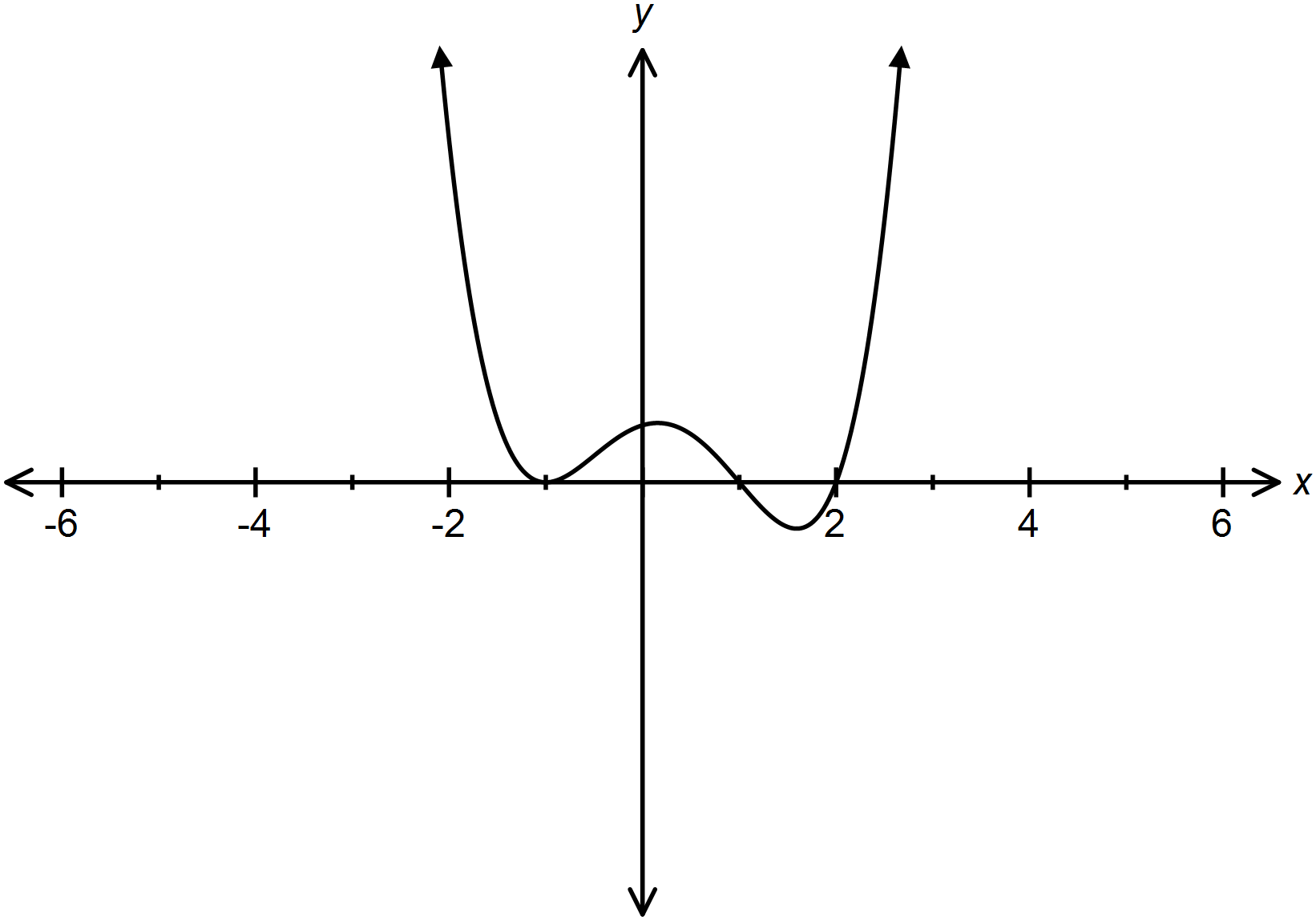
C) 

D) 

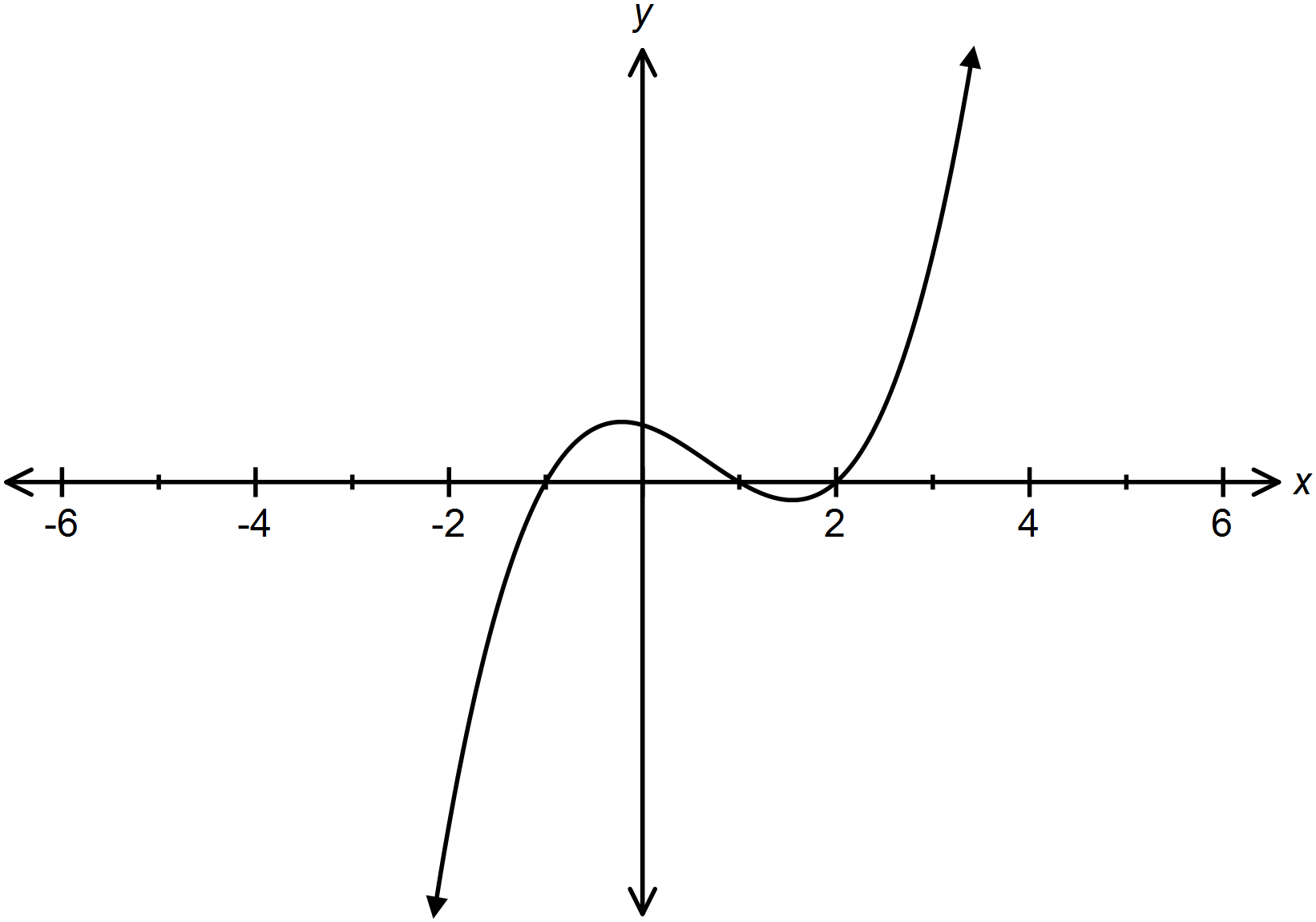
10. Which of the following graphs has negative leading coefficient and x intercepts at x = 1, x=2,

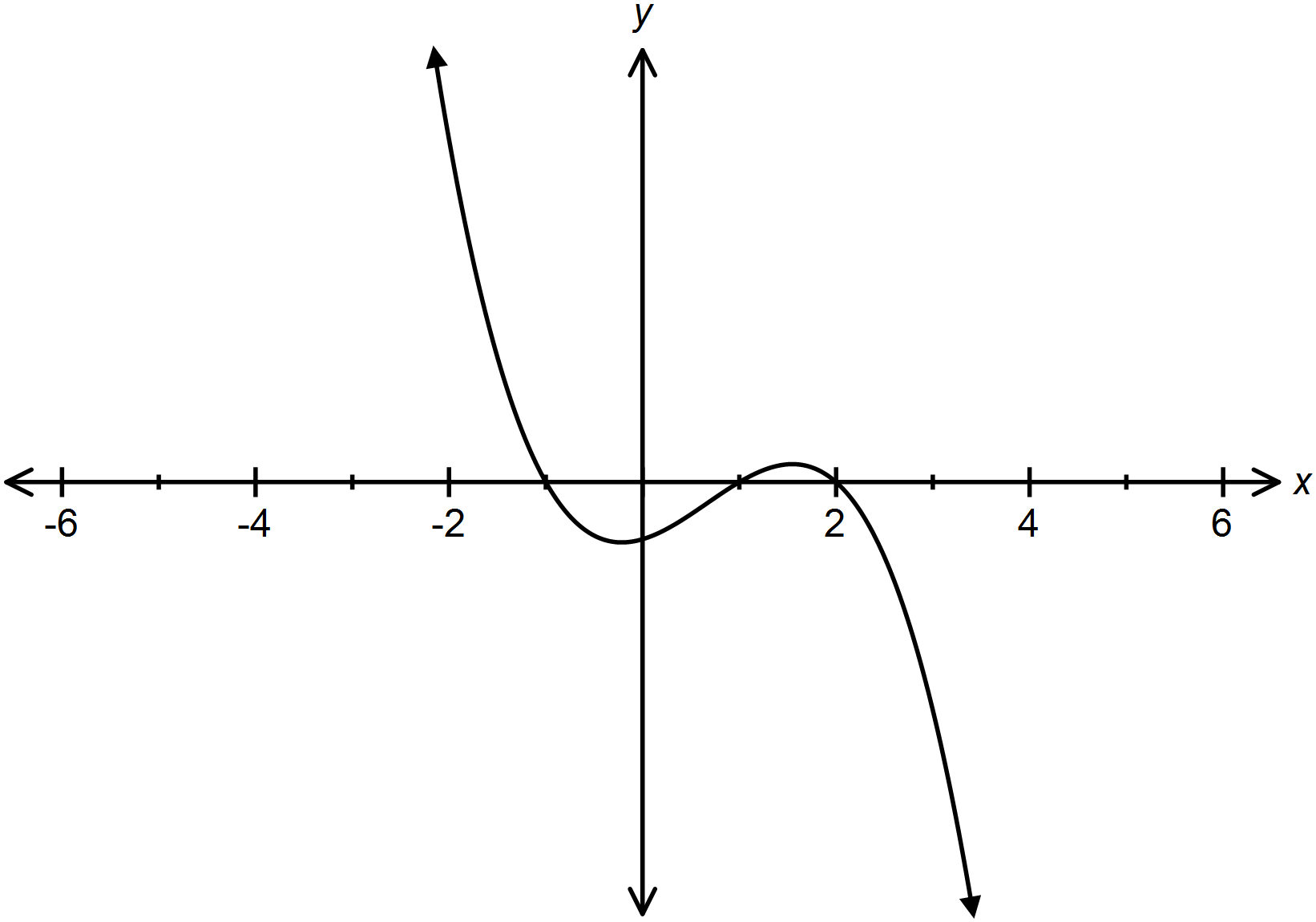
and a multiplicity of 2 at x = -1?

A) B)



C) D)





11. What is the remainder when  is divided by  ?

A) -3

B) 1

C) 9

D) 57

12. The graph of  is stretched vertically by a factor of 3. Which equation represents the transformational

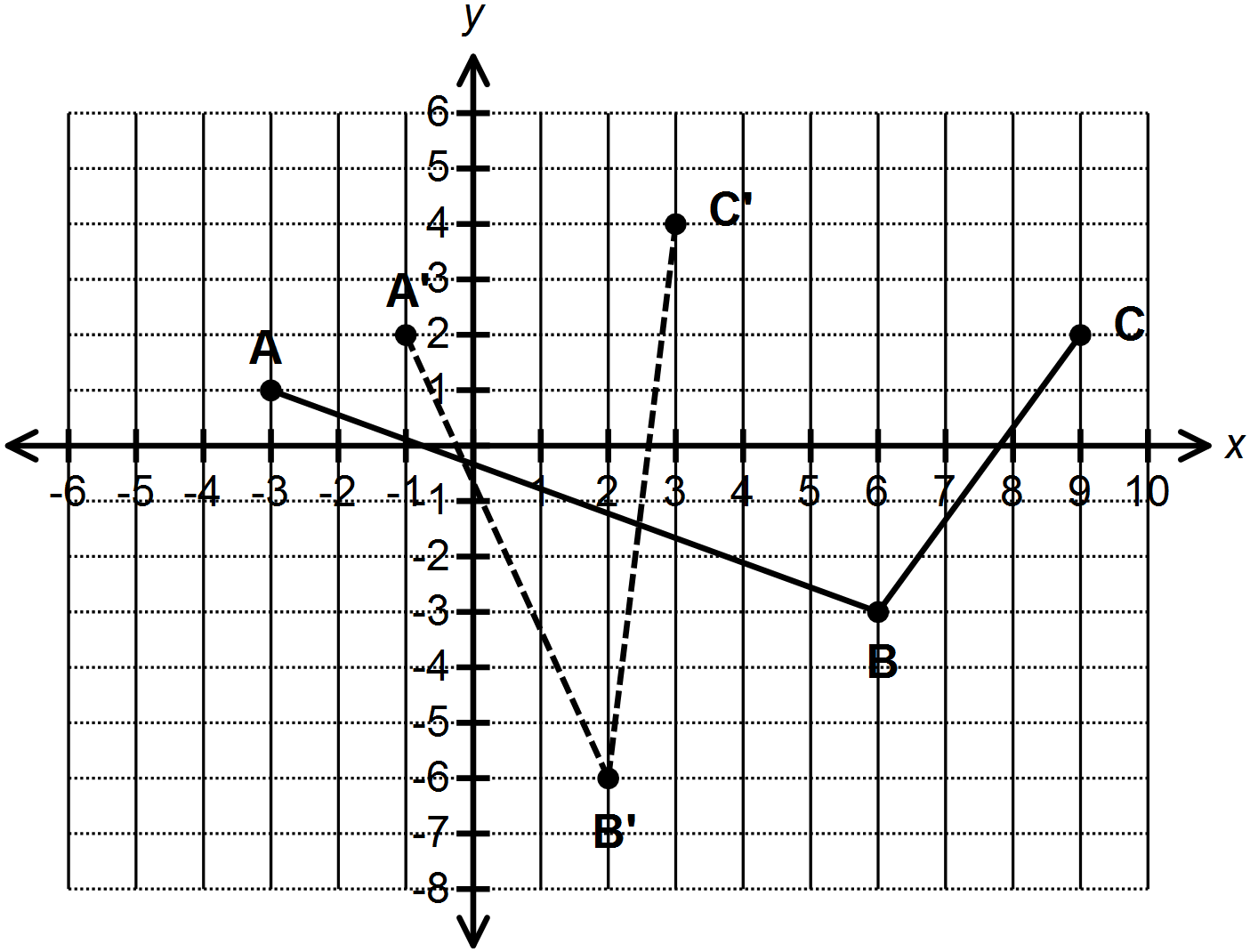
graph?

A) 

B) 

C) 

D) 

13. Which of the following is the correct equation for the graph below?

A) 

B) 

C) 

D) 

14. The point lies on the graph of . What is the image point under the transformation

?

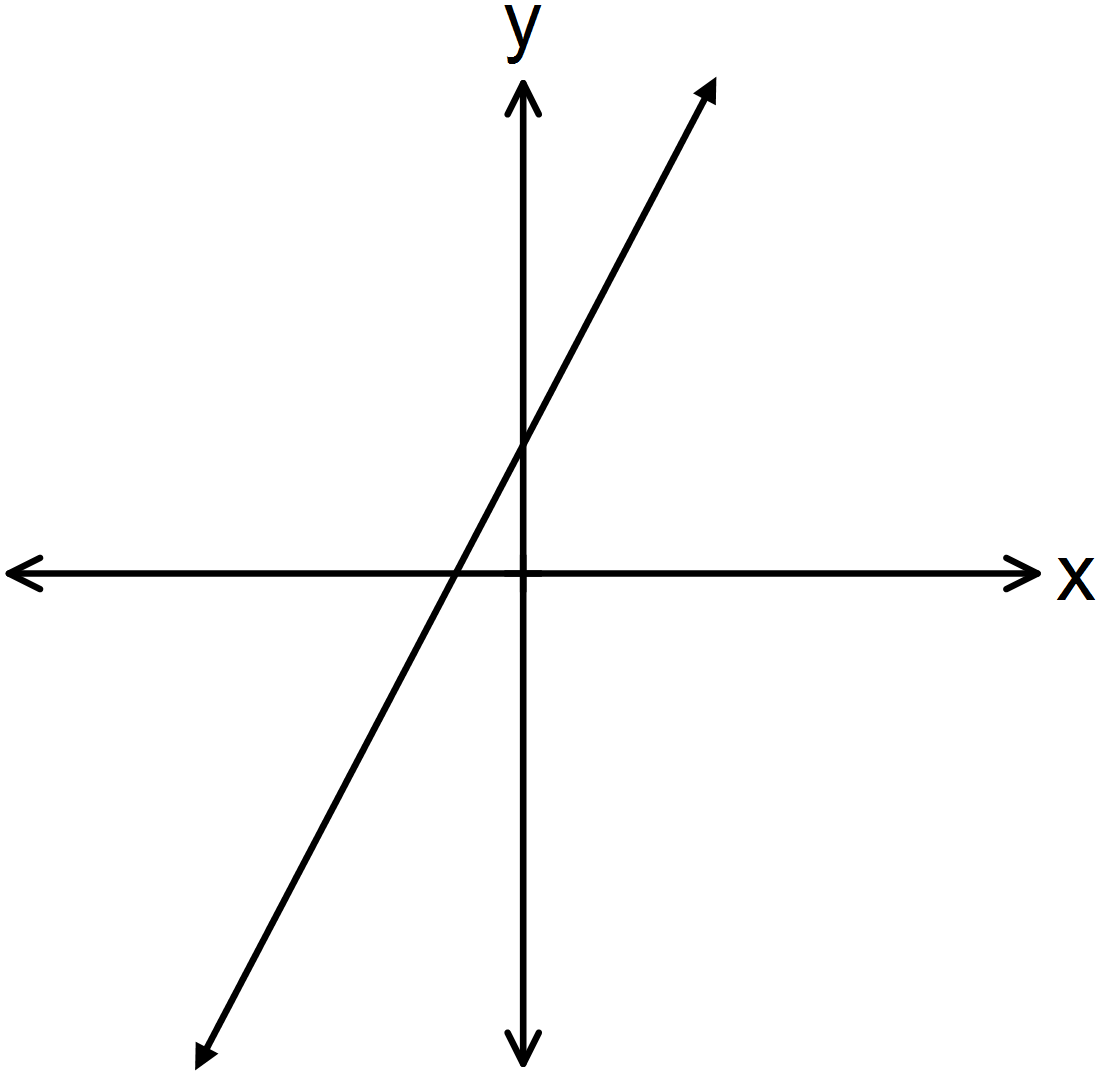
A) 

B) 

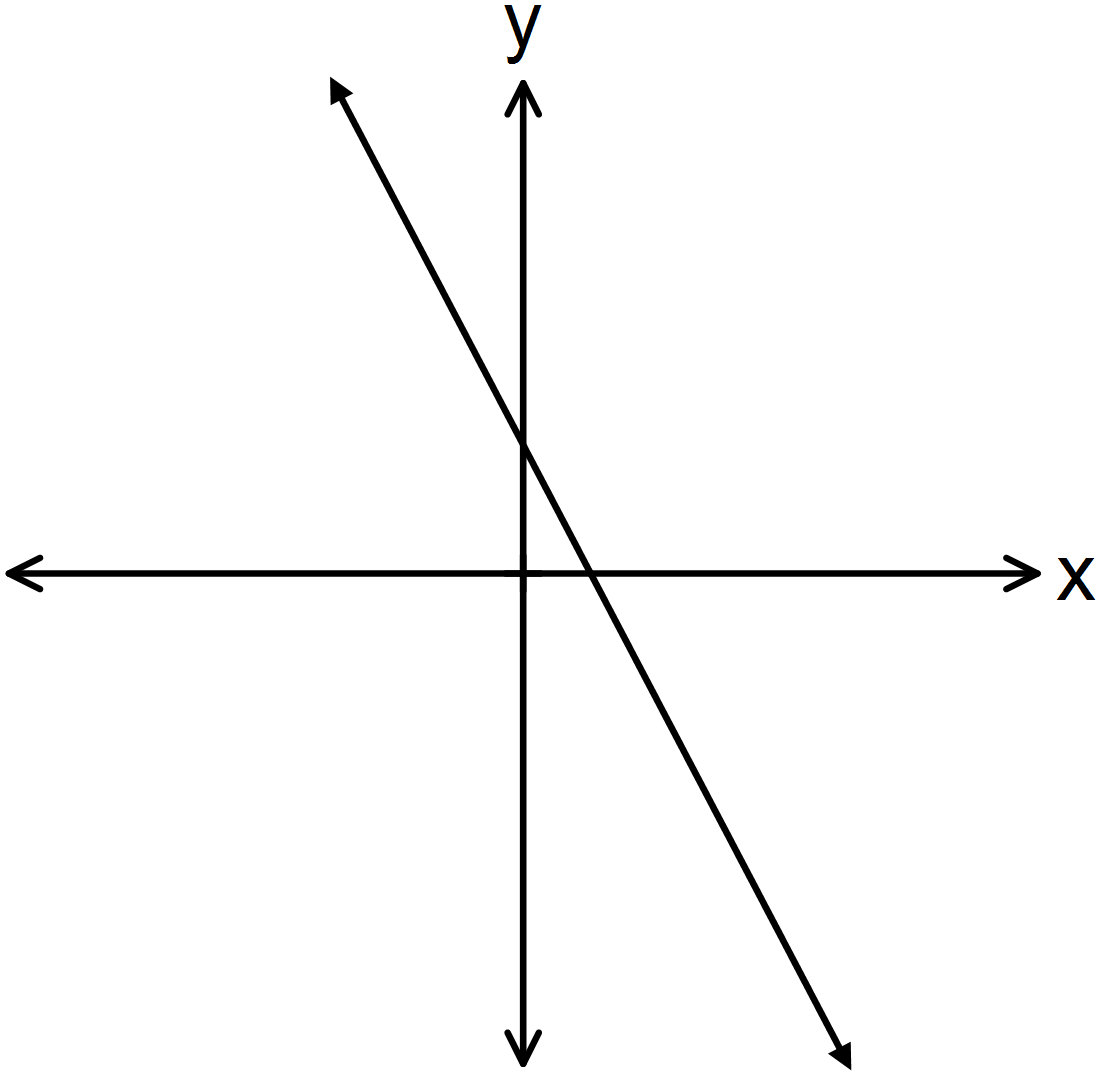
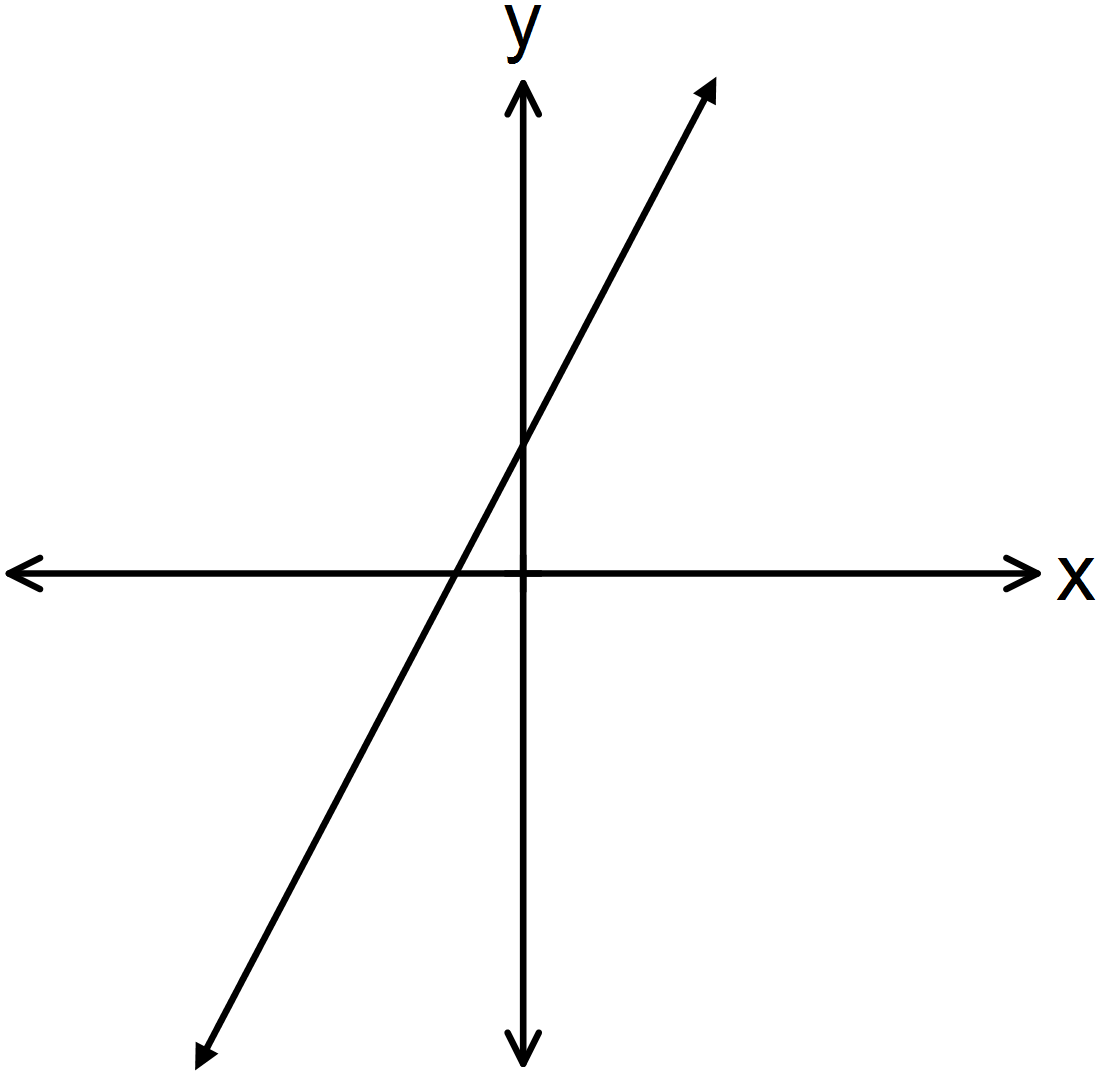
C) 

D) 

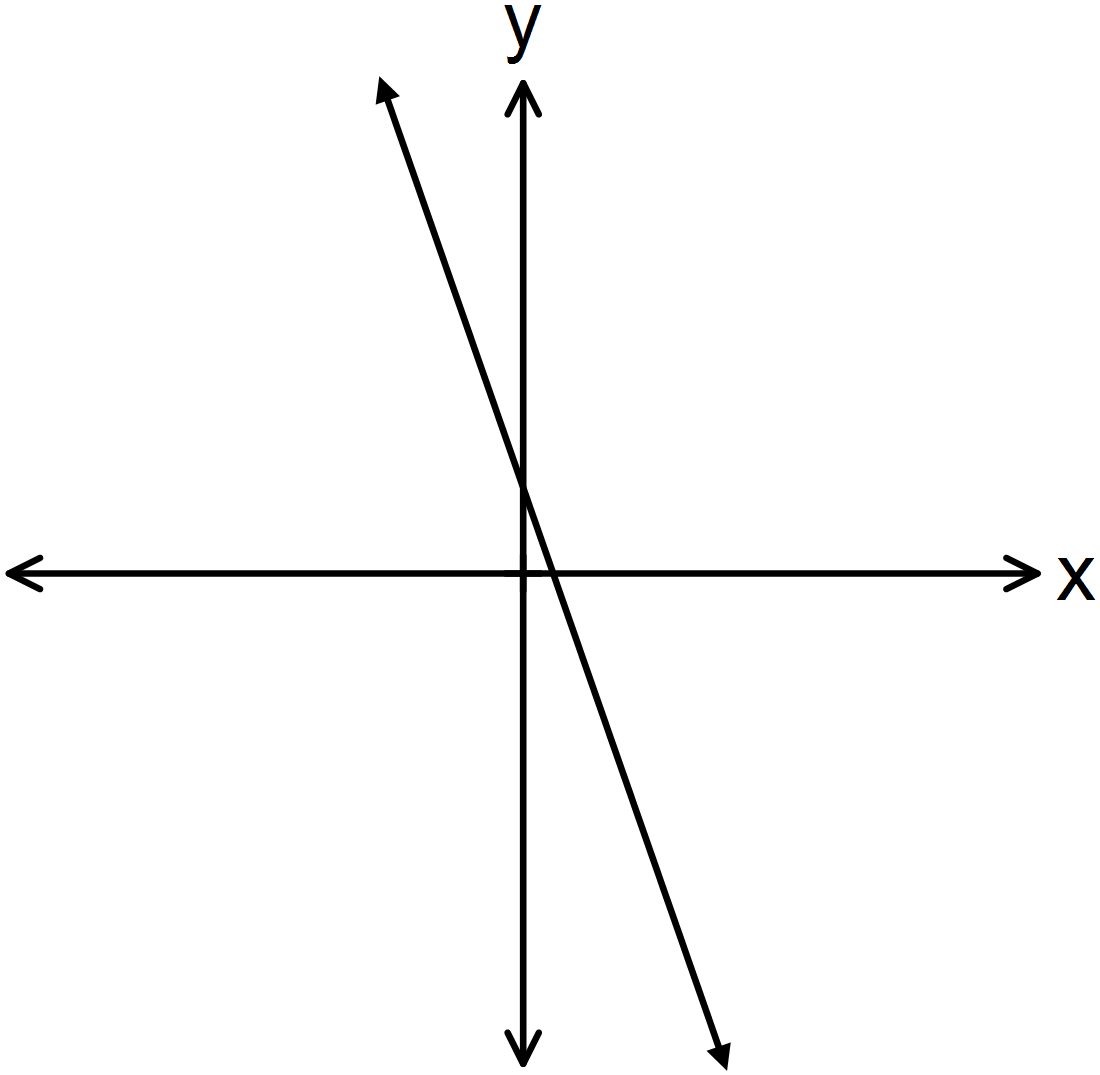
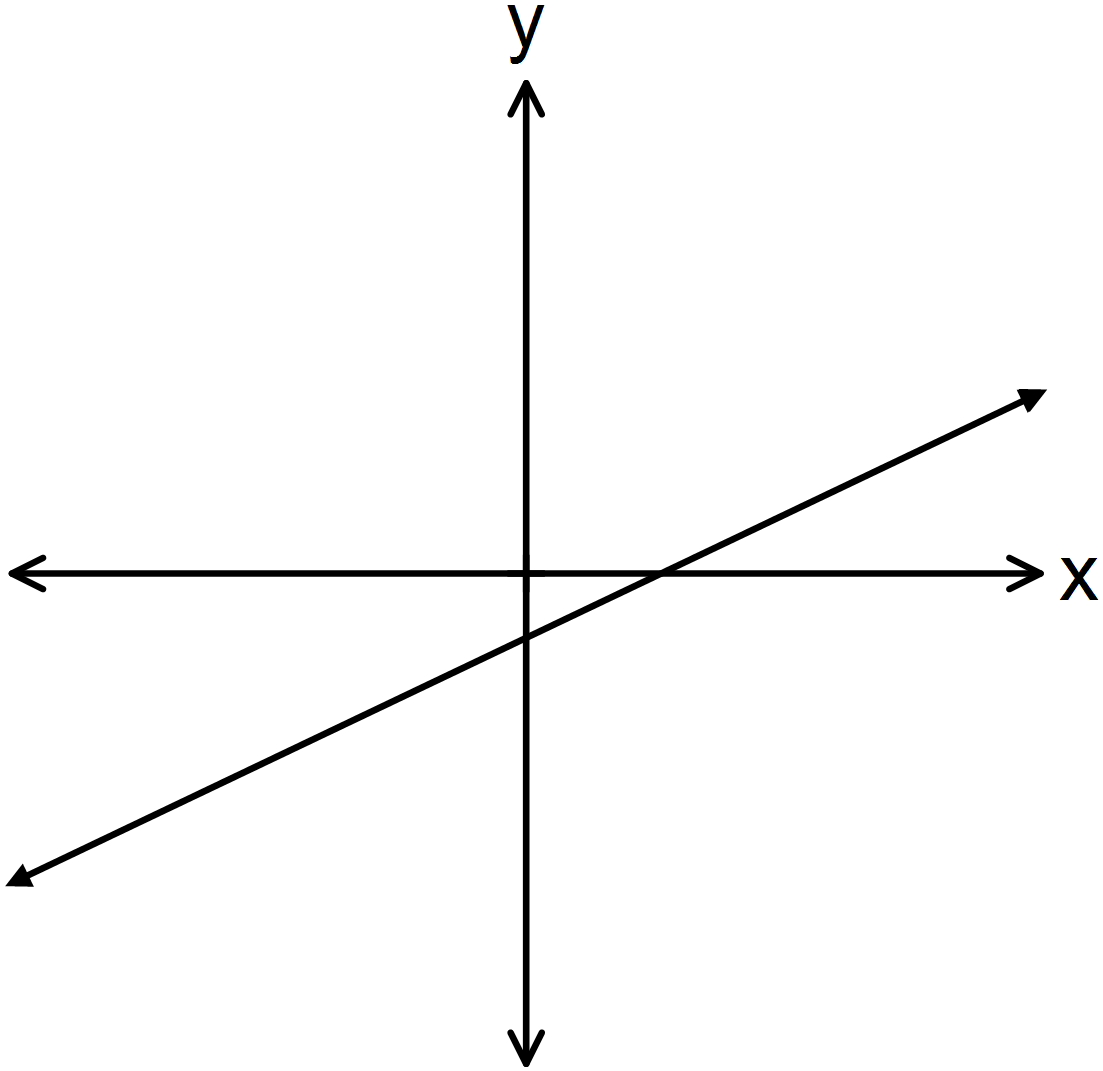
15. Which represents the inverse of the graph of  shown below?



A) B)



C) D)



16. Given mapping notation , what is the horizontal translation of ?

A) 3 units left

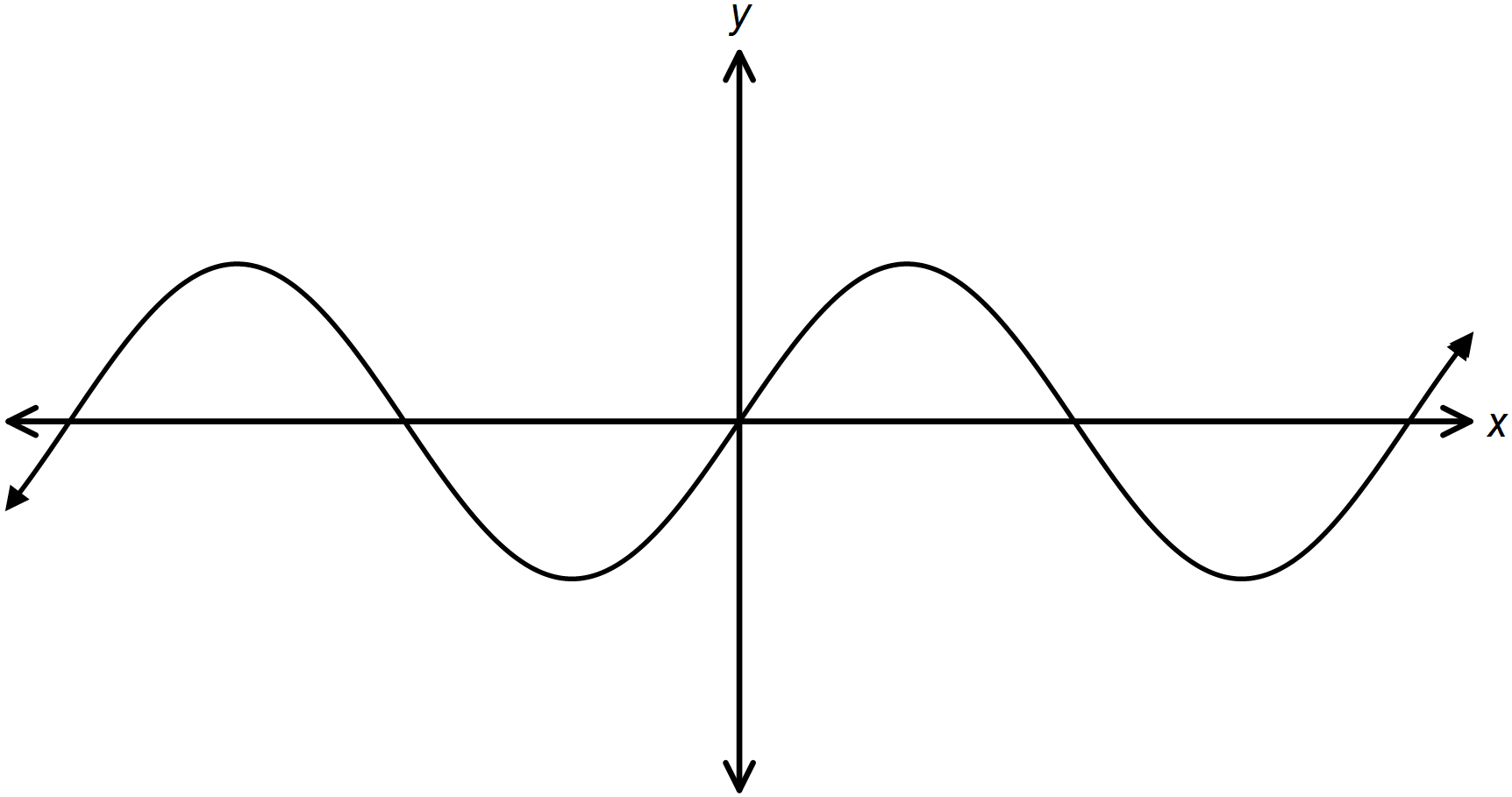
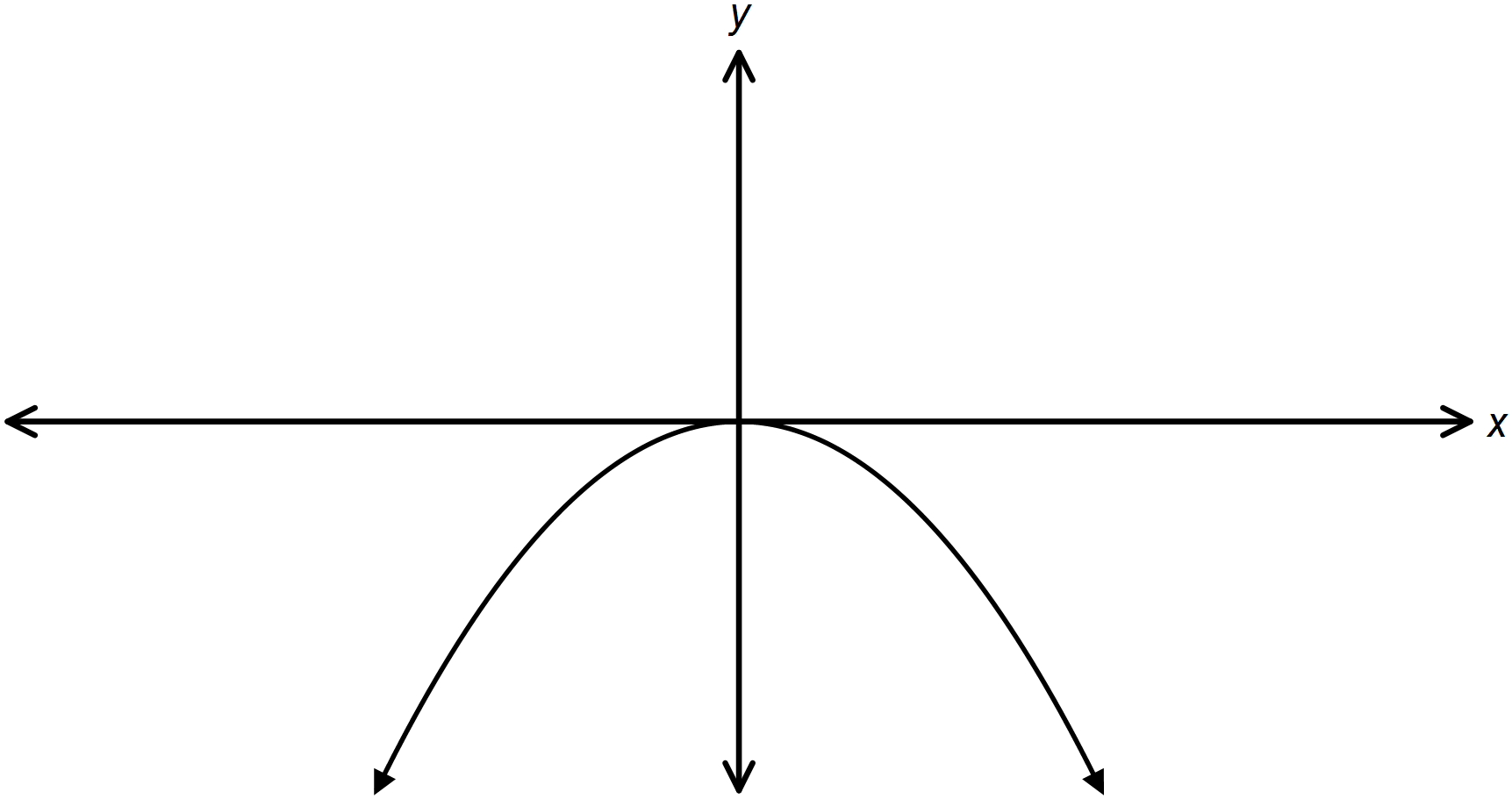
B) 3 units right

C) 15 units left

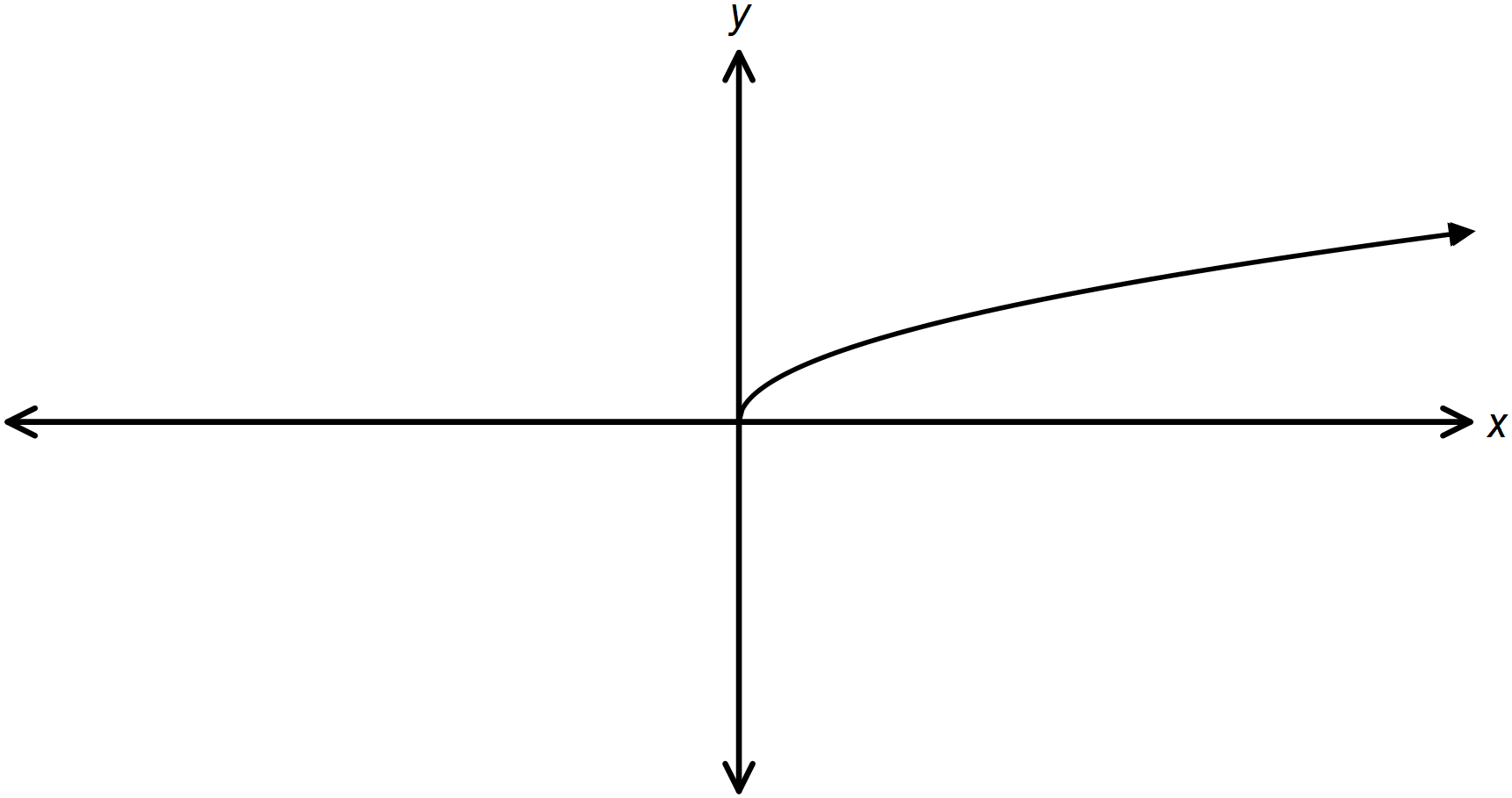
D) 15 units right

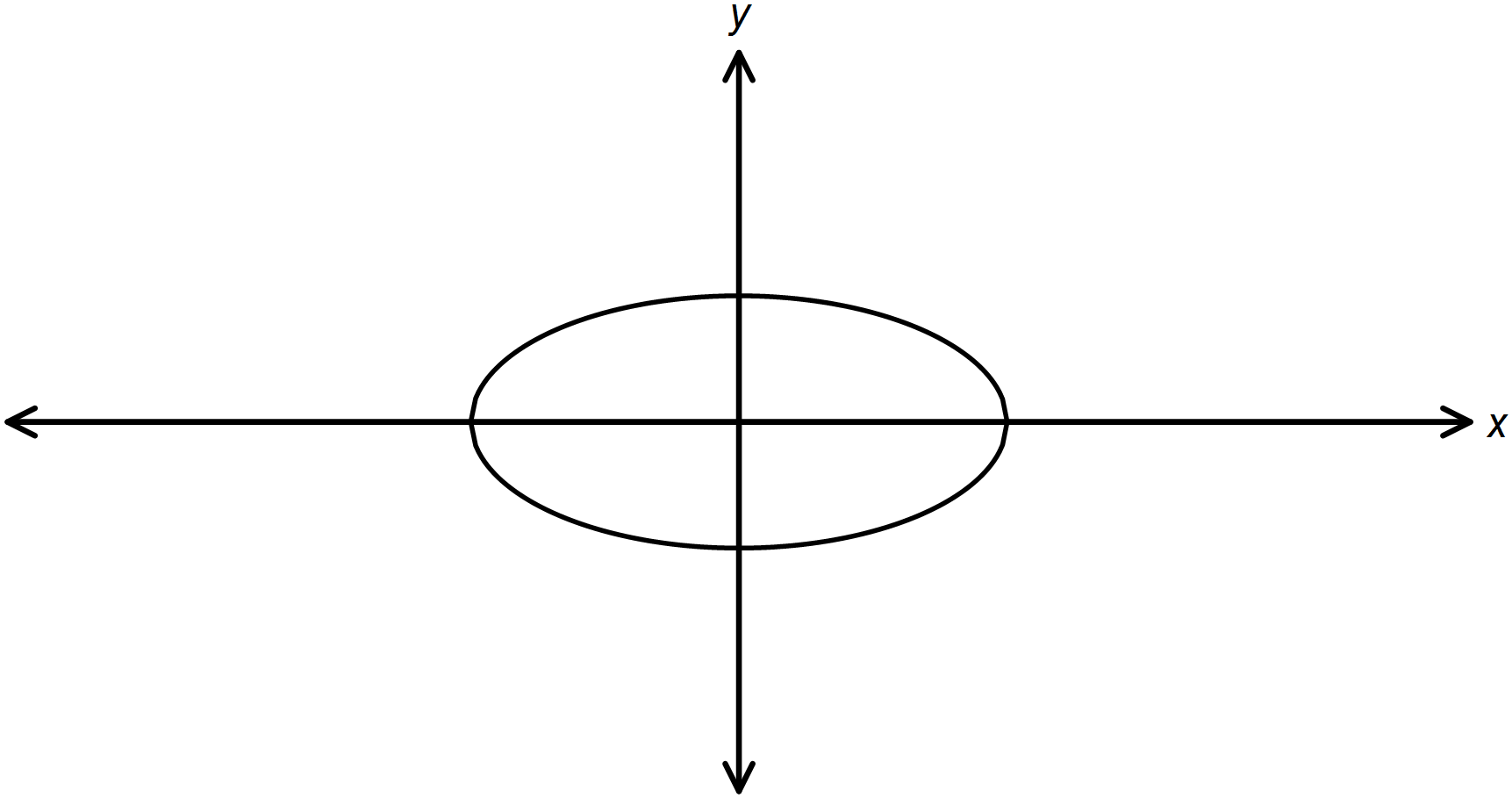
17. Which of the following graphs has an inverse that is a function?

A) B)

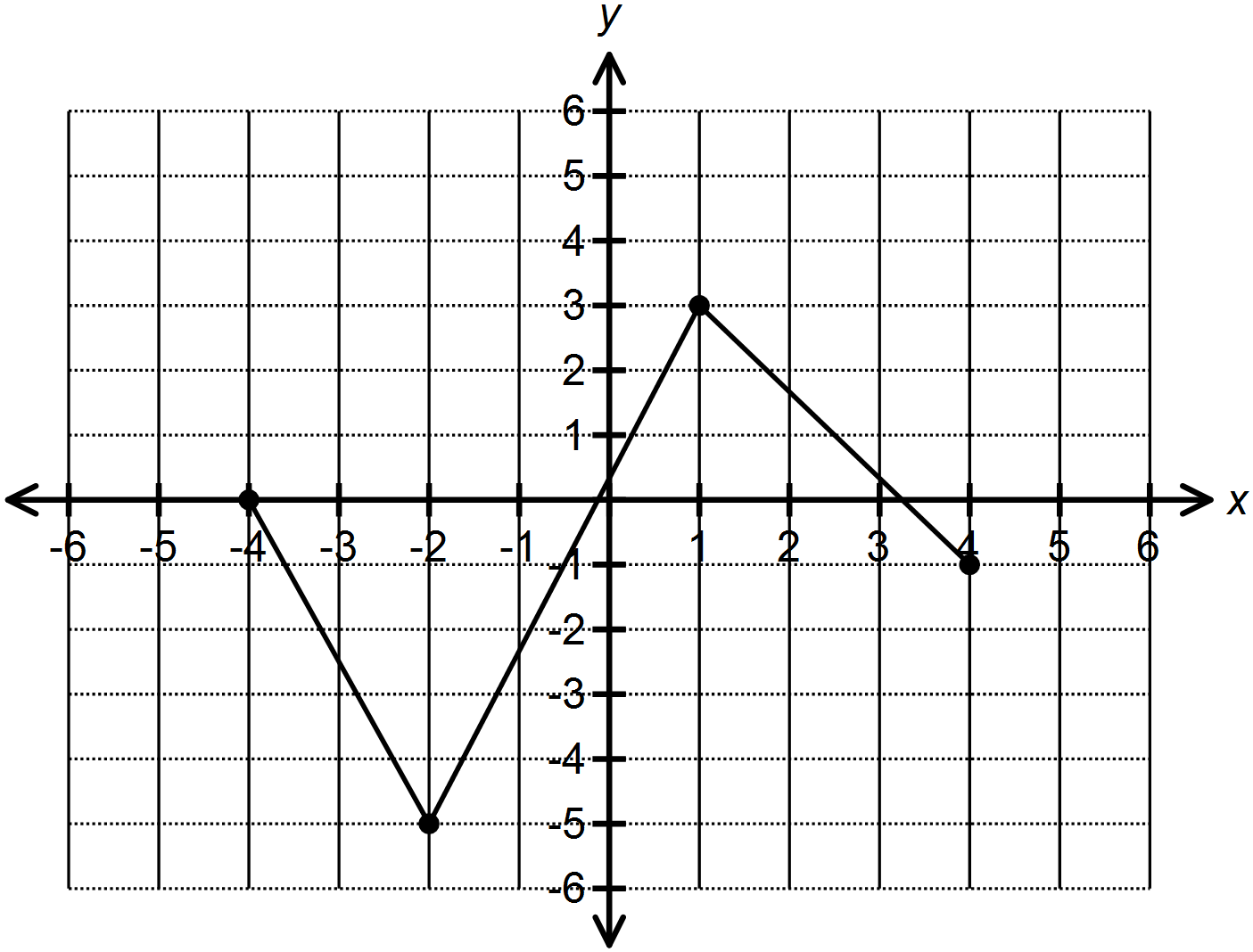


C)  D)





18. Given the graph of , what is the domain?

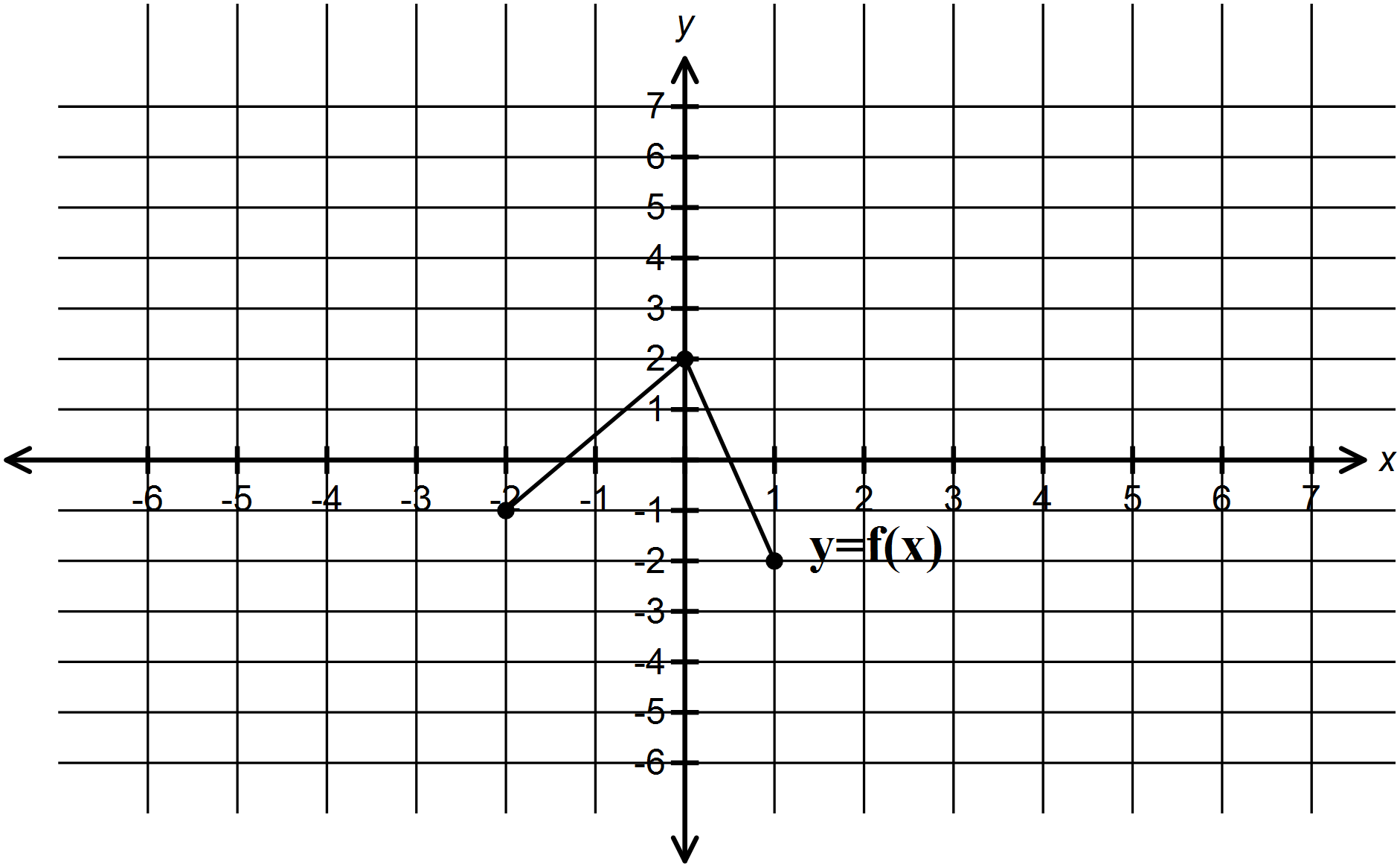


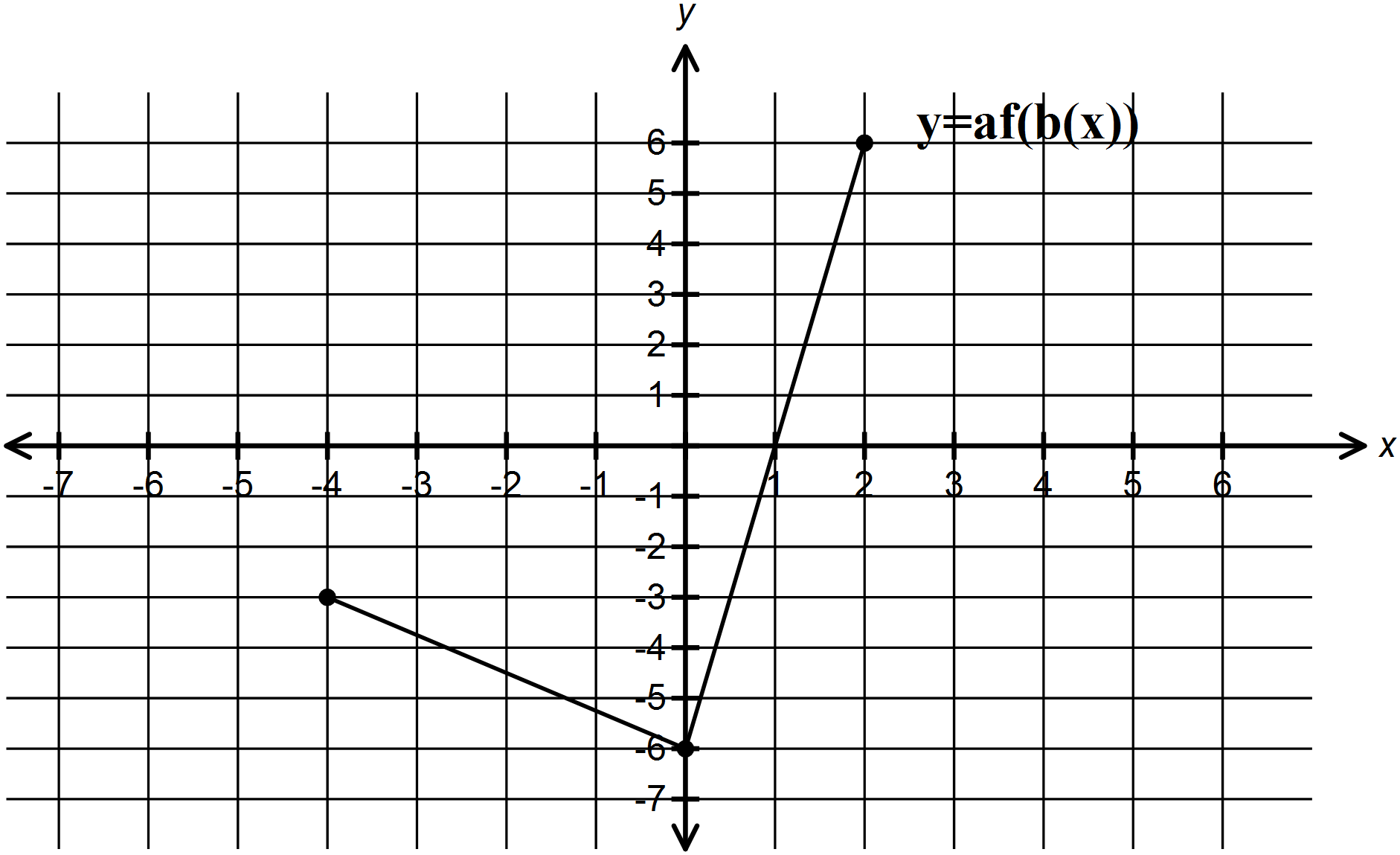
A) 

B) 

C) 

D) 

19. What is the vertical stretch factor of  when compared to ?



A) 

B) 

C) 

D) 

20. Given the function , which of the following is the inverse of  ?

A) 

B) 

C) 

D) 

21. Which of the following functions transforms  2 units to the left and 4 units up?

A) 

B) 

C) 

D) 

22. If , what is the **range** of  ?

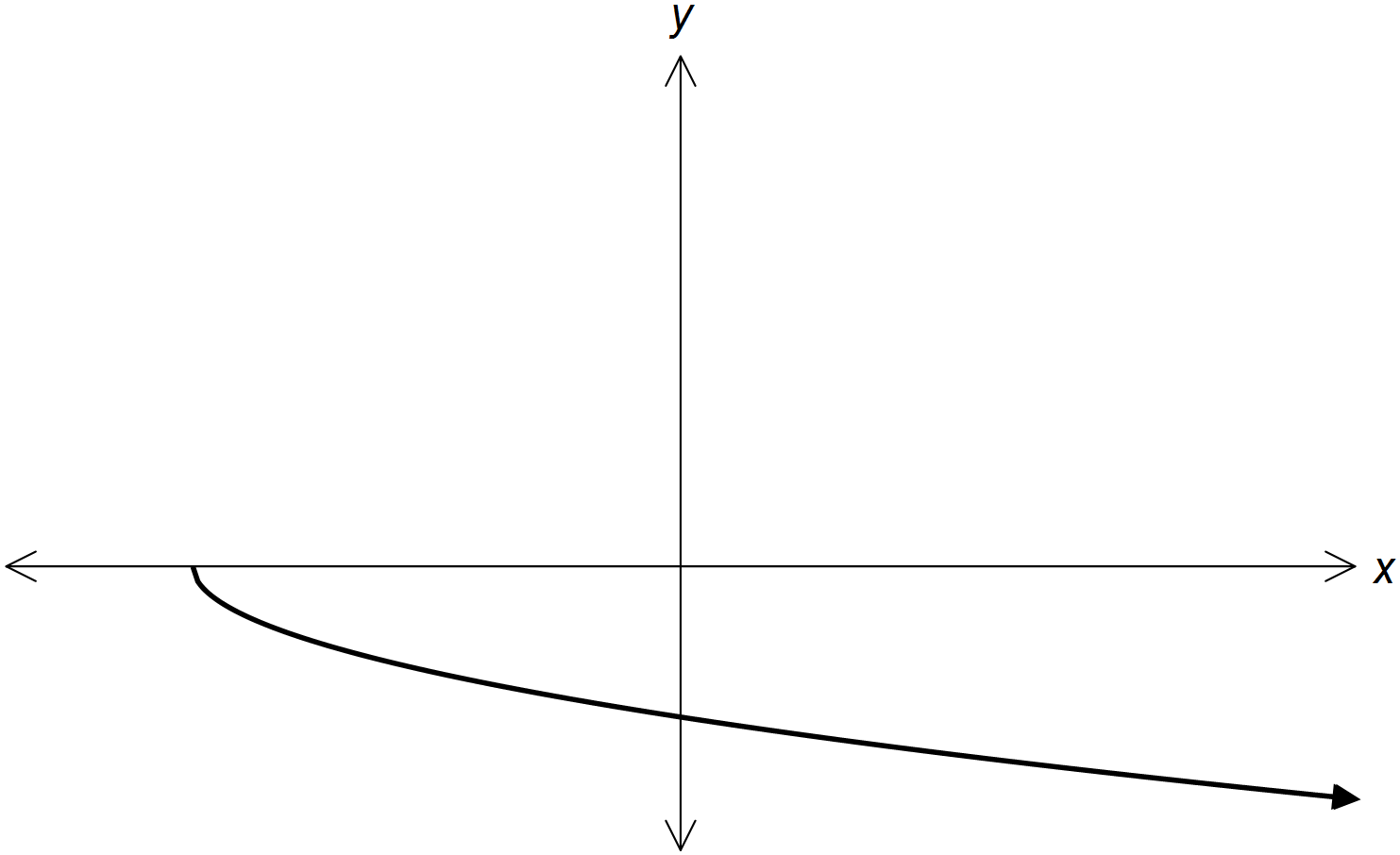
A) 

B) 

C) 

D) 

23. Which function best represents the graph below ?



A) 

B) 

C) 

D) 

24. Which is true for the function when compared to ?

|  |  |  |
| --- | --- | --- |
|  | **Vertical Translation** | **Horizontal Translation** |
| A) | -9 | -2 |
| B) | 9 | -2 |
| C) | -3 | -2 |
| D) | 3 | -2 |

26. What are all the invariant points for the graph of and ?

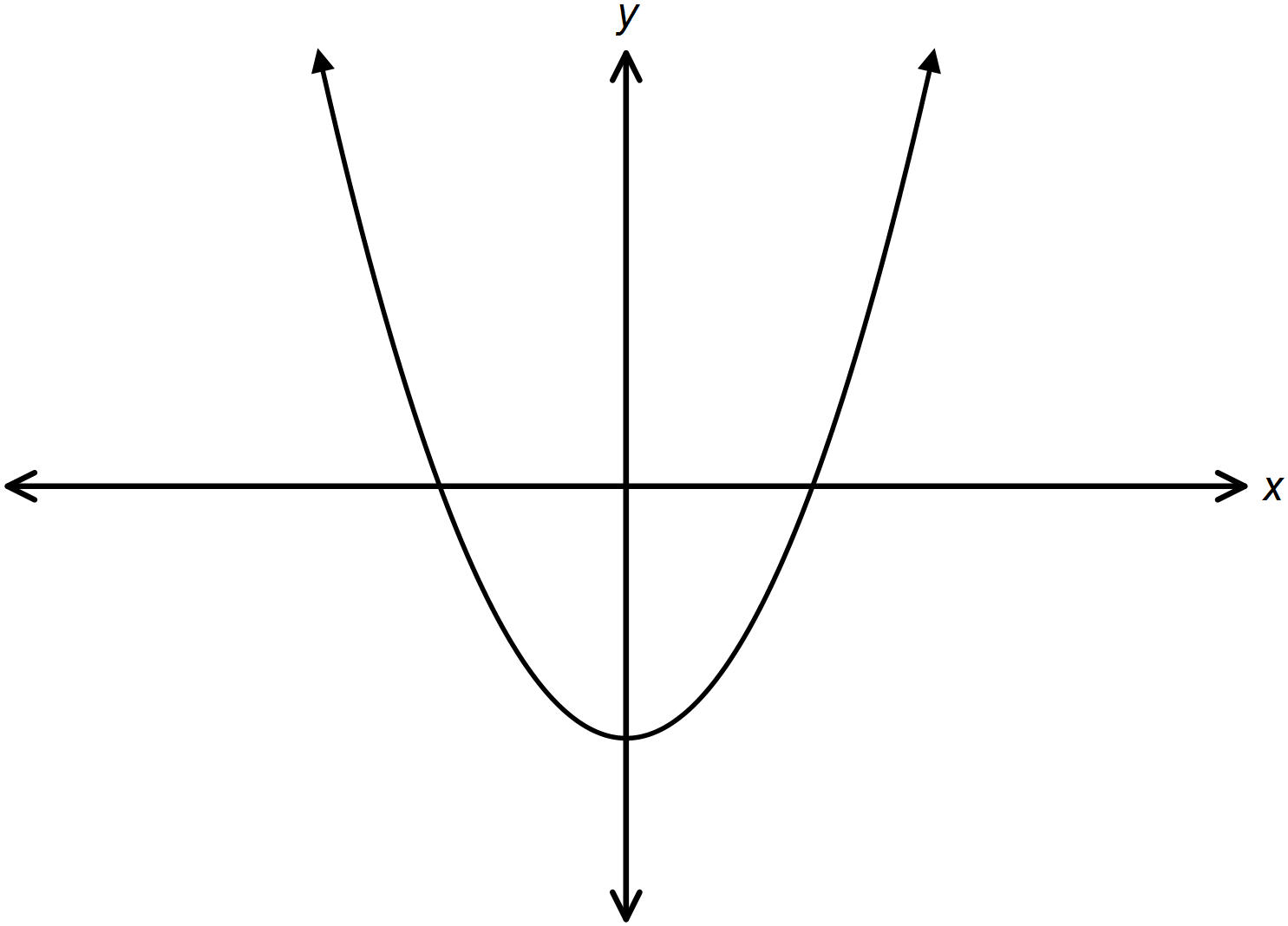
A) 

B) 

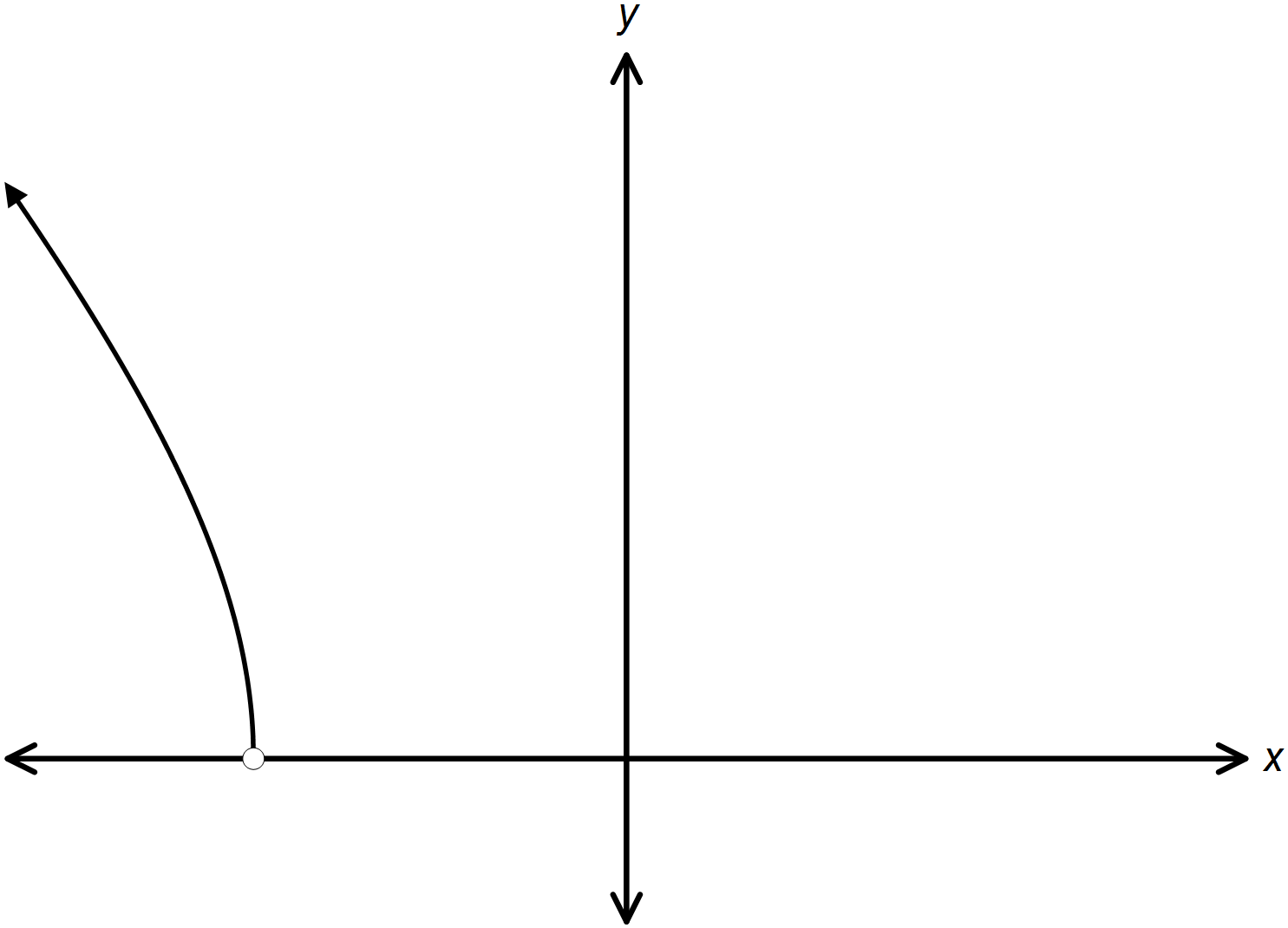
C) 

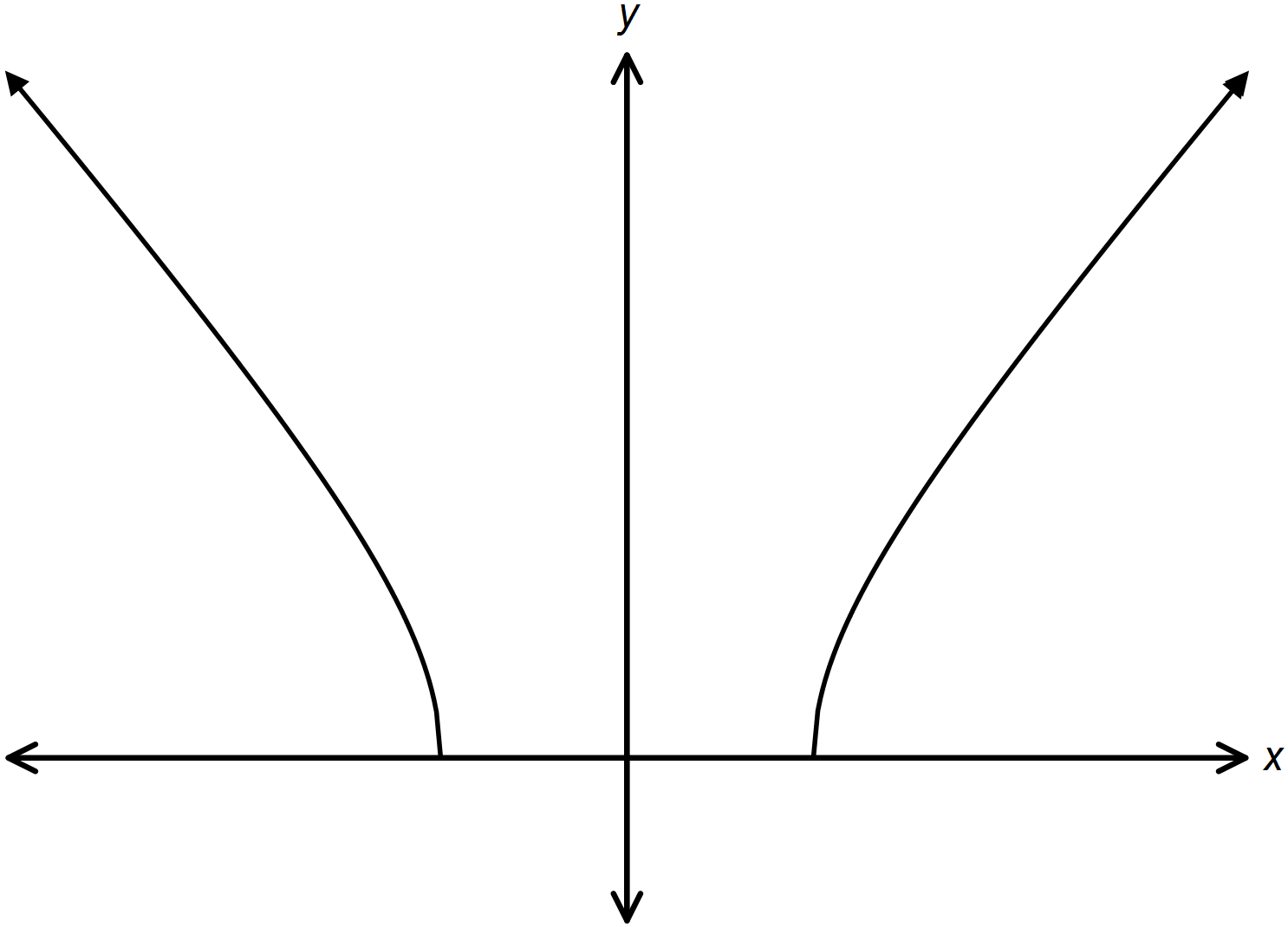
D) 

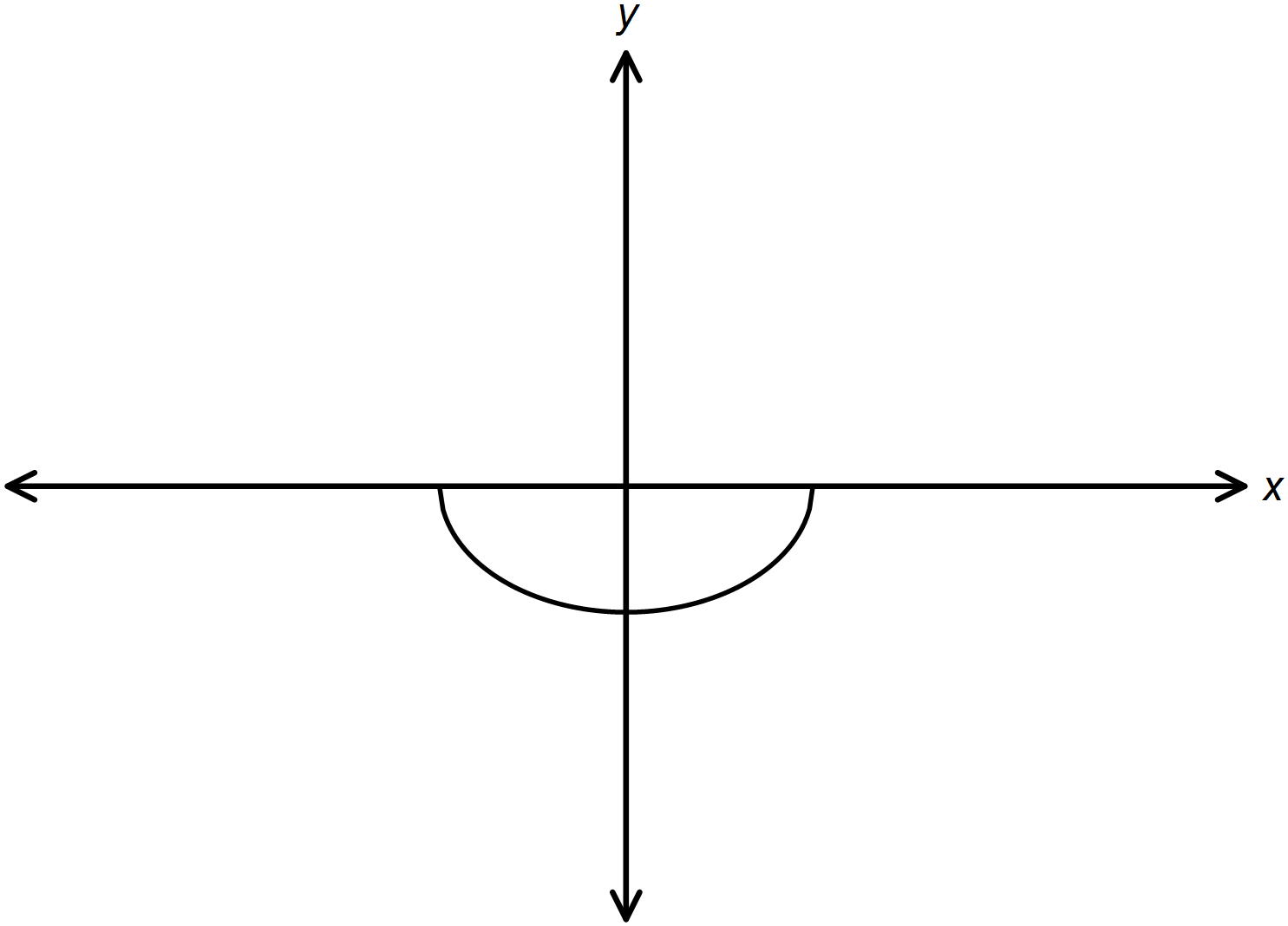
27. Given the graph of as shown, which of the following is the graph of ?



A) B)



 C) D)



28. What is  as a radian measure?

A) 

B) 

C) 

D) 

29. What is the length of an arc cut off by a sector with a central angle measuring in a circle with a radius

measuring 20 cm?

A) 

B) 

C) 

D) 

30. Solve for x: 

A) 

B) 

C) 

D) 

31. Which of the following pairs of angles are coterminal with each other?

A) 

B) 

C) 

D) 

32. In which quadrant is cotangent positive and secant negative?

A) I

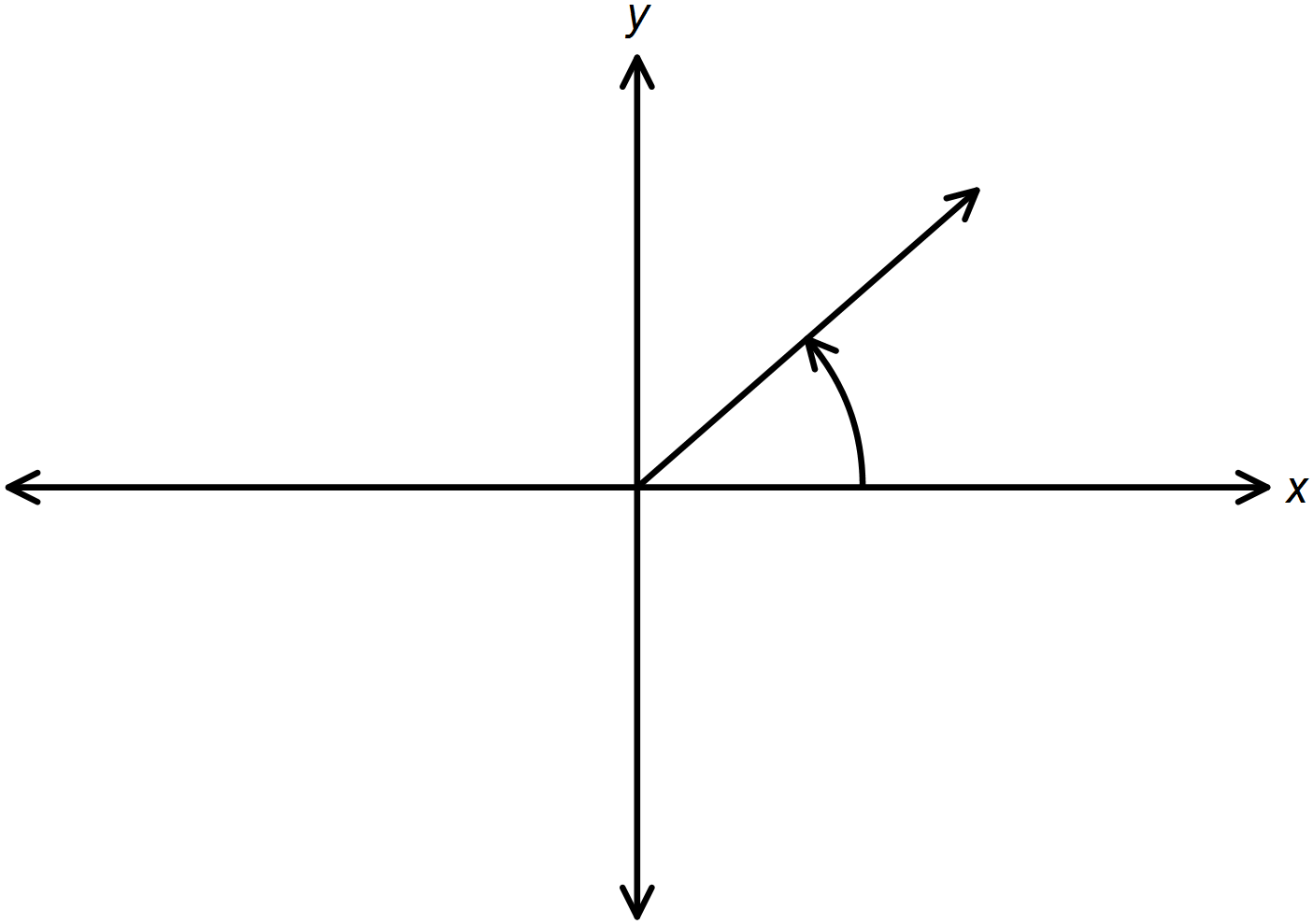
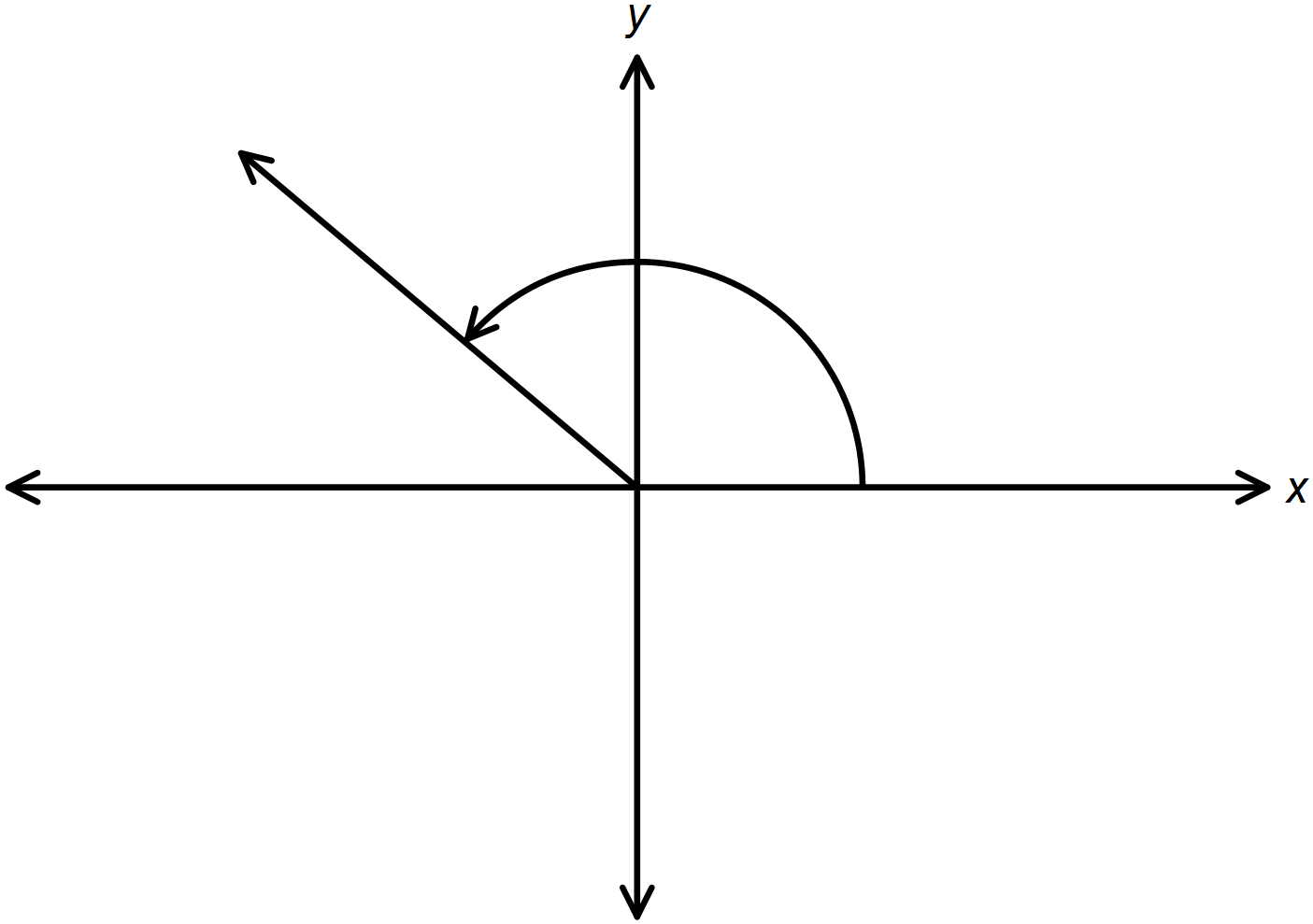
B) II

C) III

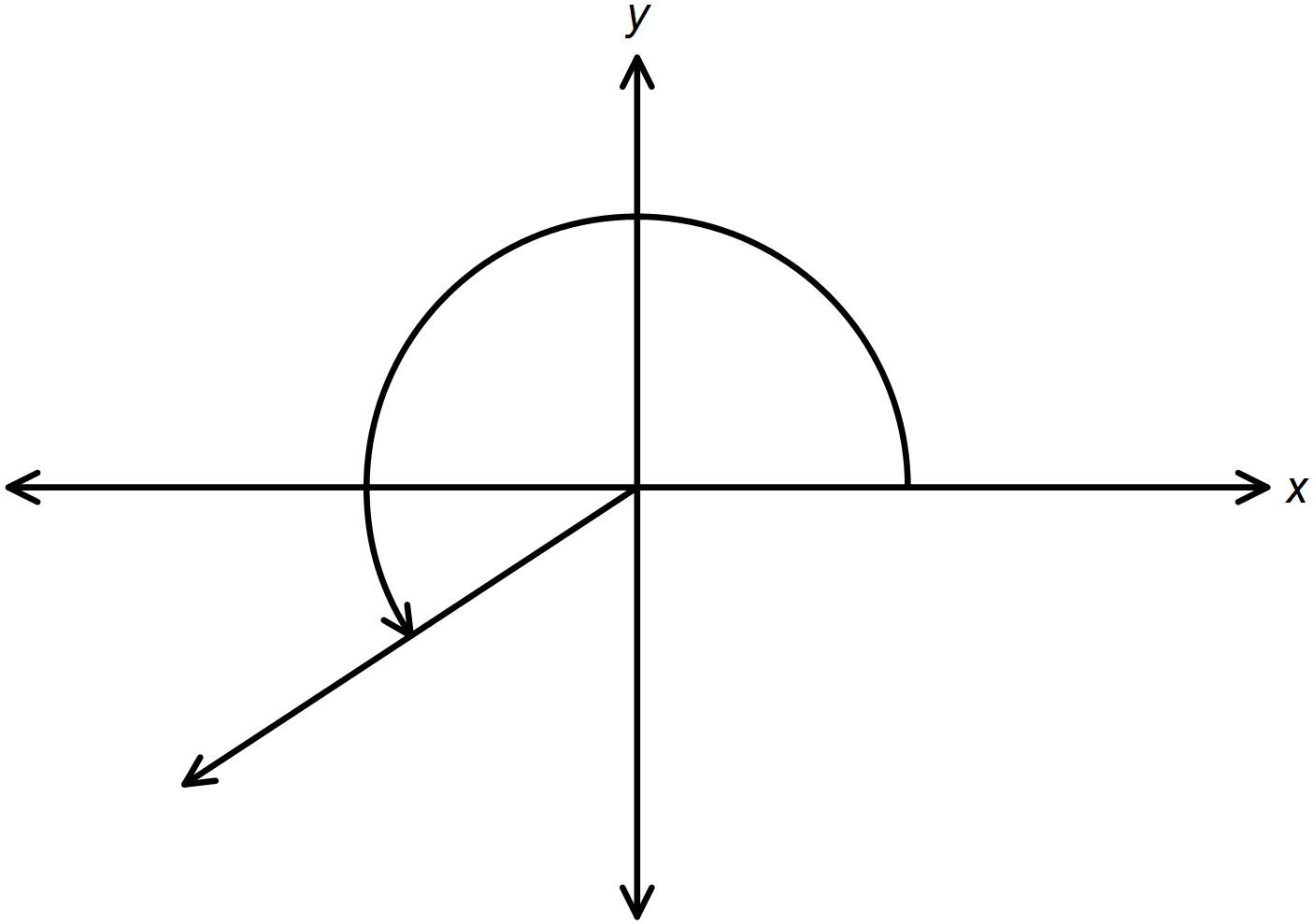
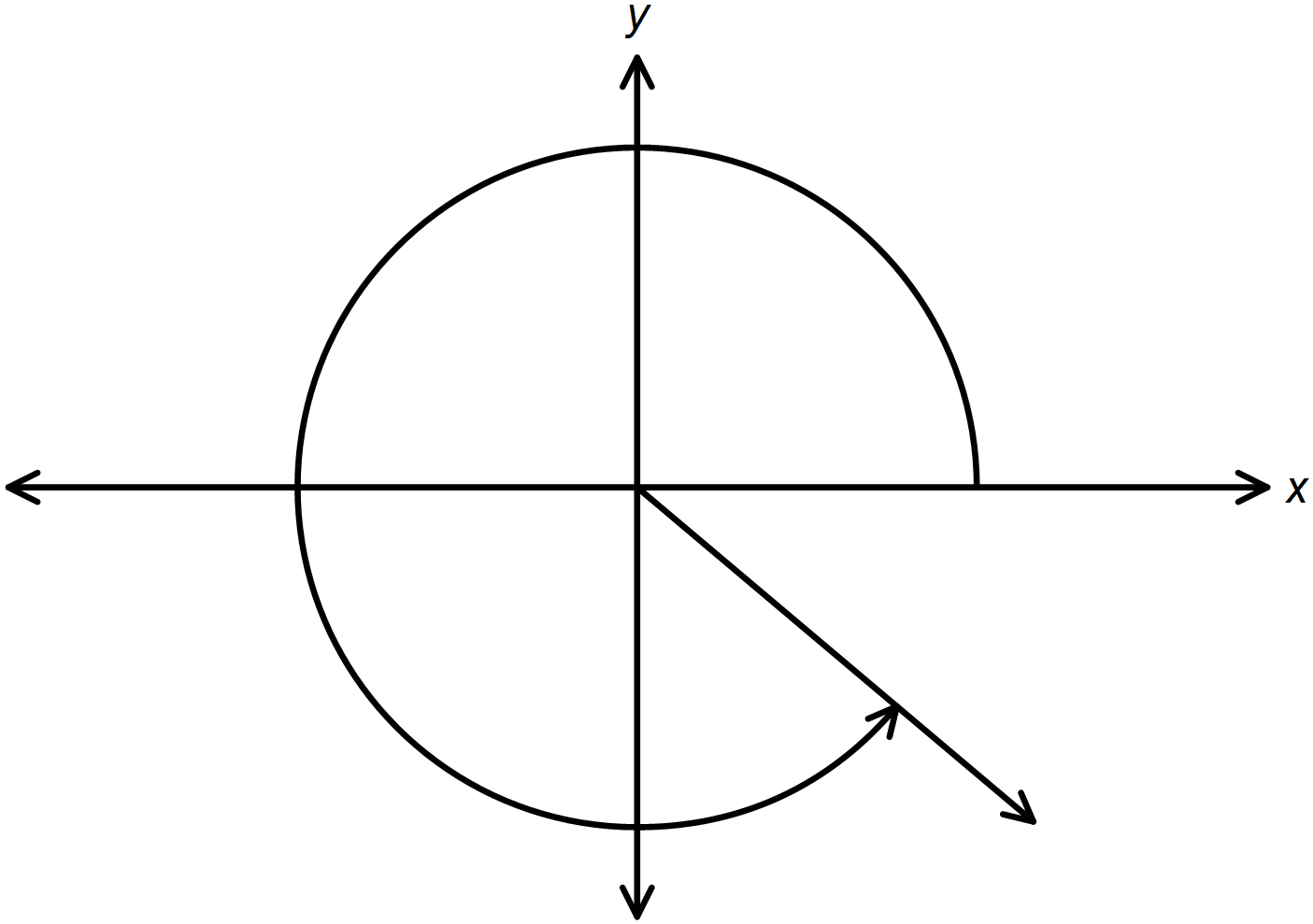
D) IV

33. Which of the following represents an angle in standard position measuring radians?

A) B)



C) D)



34. The point (-6, 8) is on the terminal arm of an angle, θ, in standard position. What is the exact value of ?

A) 

B) 

C) 

D) 

35. If  and is in the fourth quadrant . What is the exact value of ?

A) 

B) 

C) 

D) 

36. What characteristic is the same for the graphs of  and  ?

A) Amplitude

B) Asymptotes

C) Period

D) y intercept

37. Given the function , what is the maximum value of its graph?

A) 2

B) 3

C) 5

D) 6

38. Given the function , what is the period of its graph?

A) 

B) 

C) 

D) 

39. What is the equation of a circle with centre at the origin and a radius of 8 units?

A) 

B) 

C) 

D) 

40. Which of the following is true for the tangent function?

A) Period = 

B) Domain is all real numbers.

C) Y intercept is 1

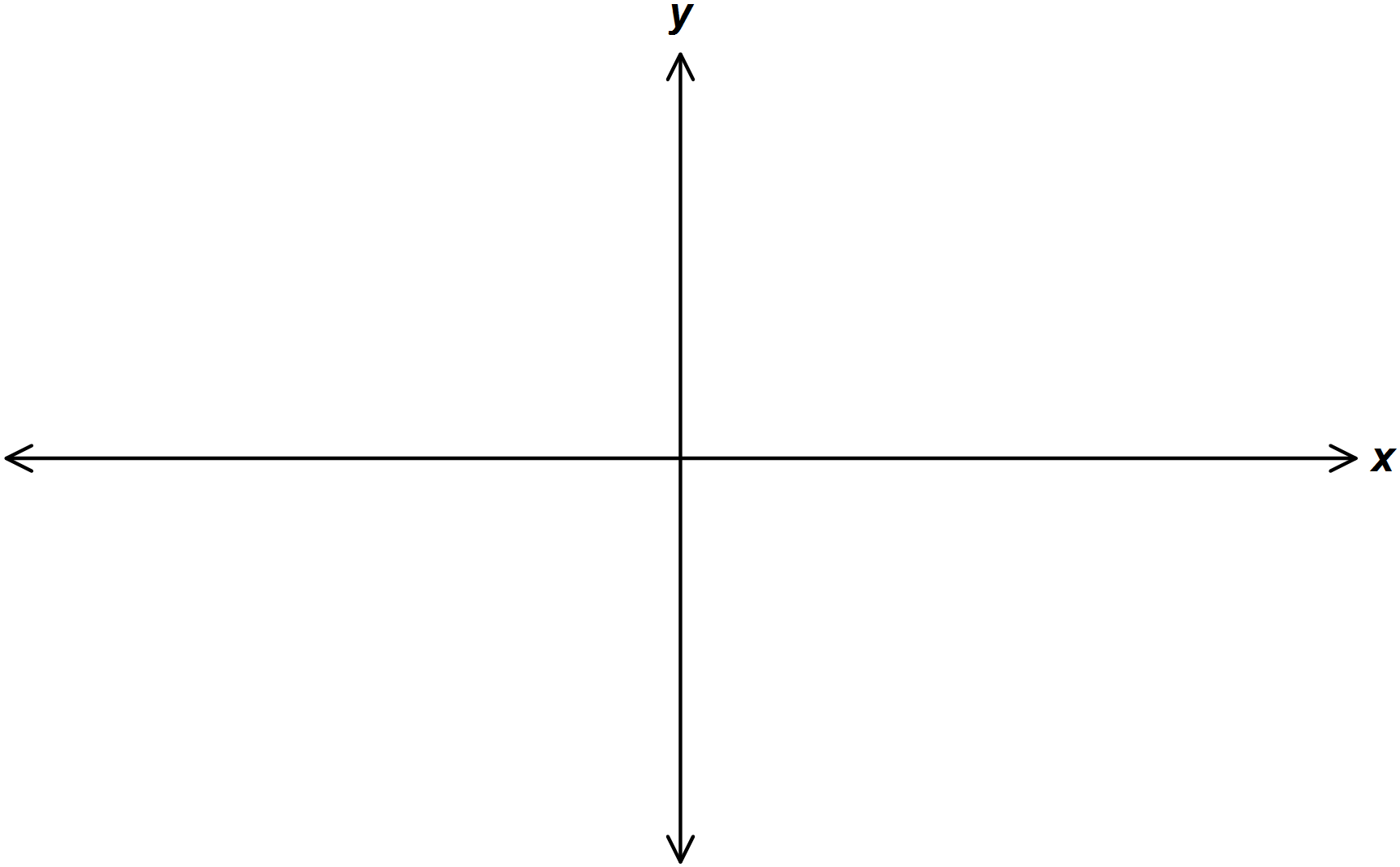
D) 

**Section B - Constructed Response (40 marks)**

**Directions:** Answer all questions on the examination paper and show your workings.

1. Sketch the graph of the function  and clearly label the x intercept(s) and y intercept.

**(4 marks)**



2. Write the equation for the function with zeros at 2 (multiplicity of 2), -1(multiplicity of 1) and 1(multiplicity of 1)

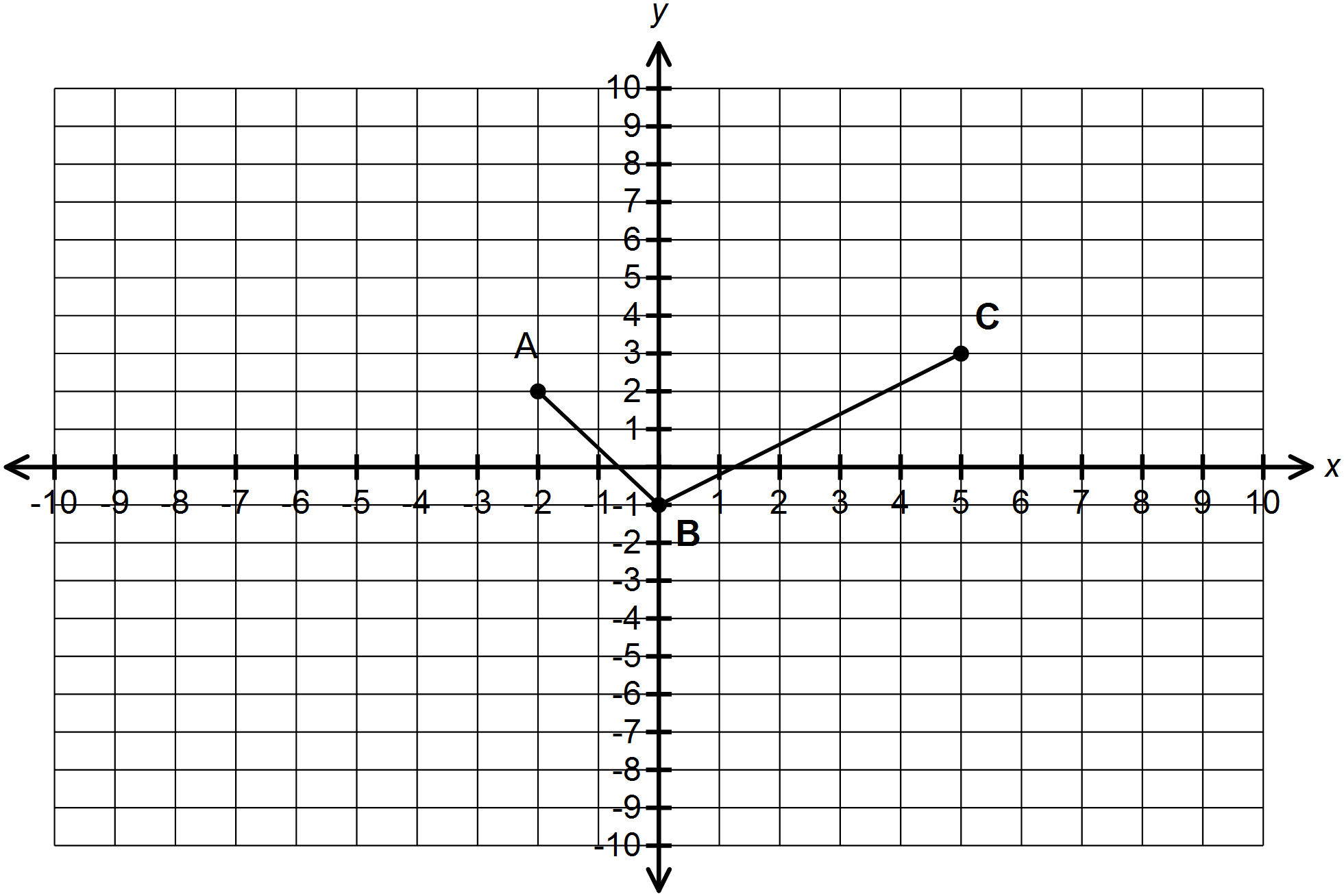
and a y intercept of -12. **(4 marks)**

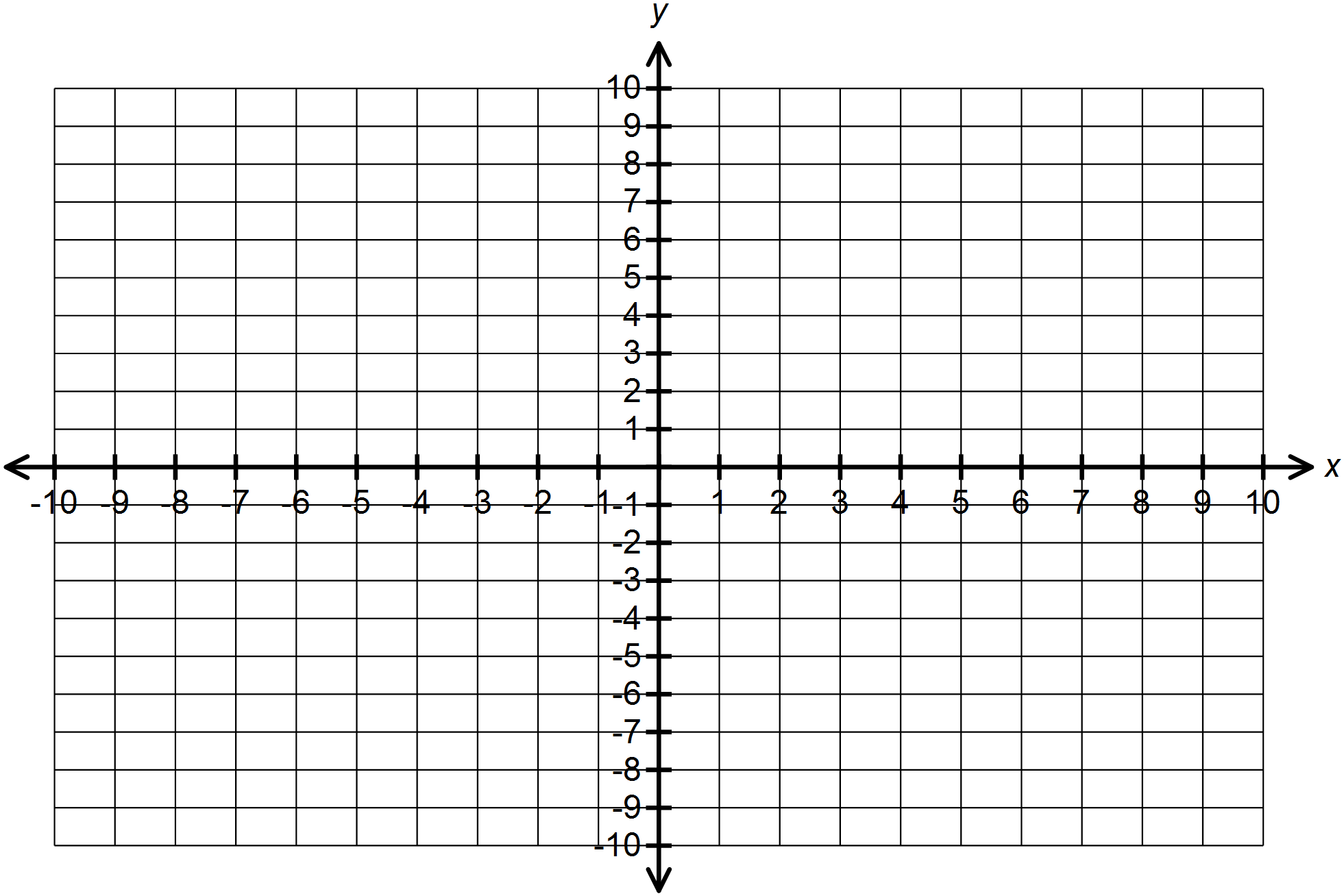
3. The length, width and height of a rectangular box are  cm, (x - 4) cm and  cm respectively. Find

the dimension of the box if the volume is 132 cm3 . **(3 marks)**

4. Given the graph of the function shown, Sketch the graph of the inverse of .

**(4 marks)**

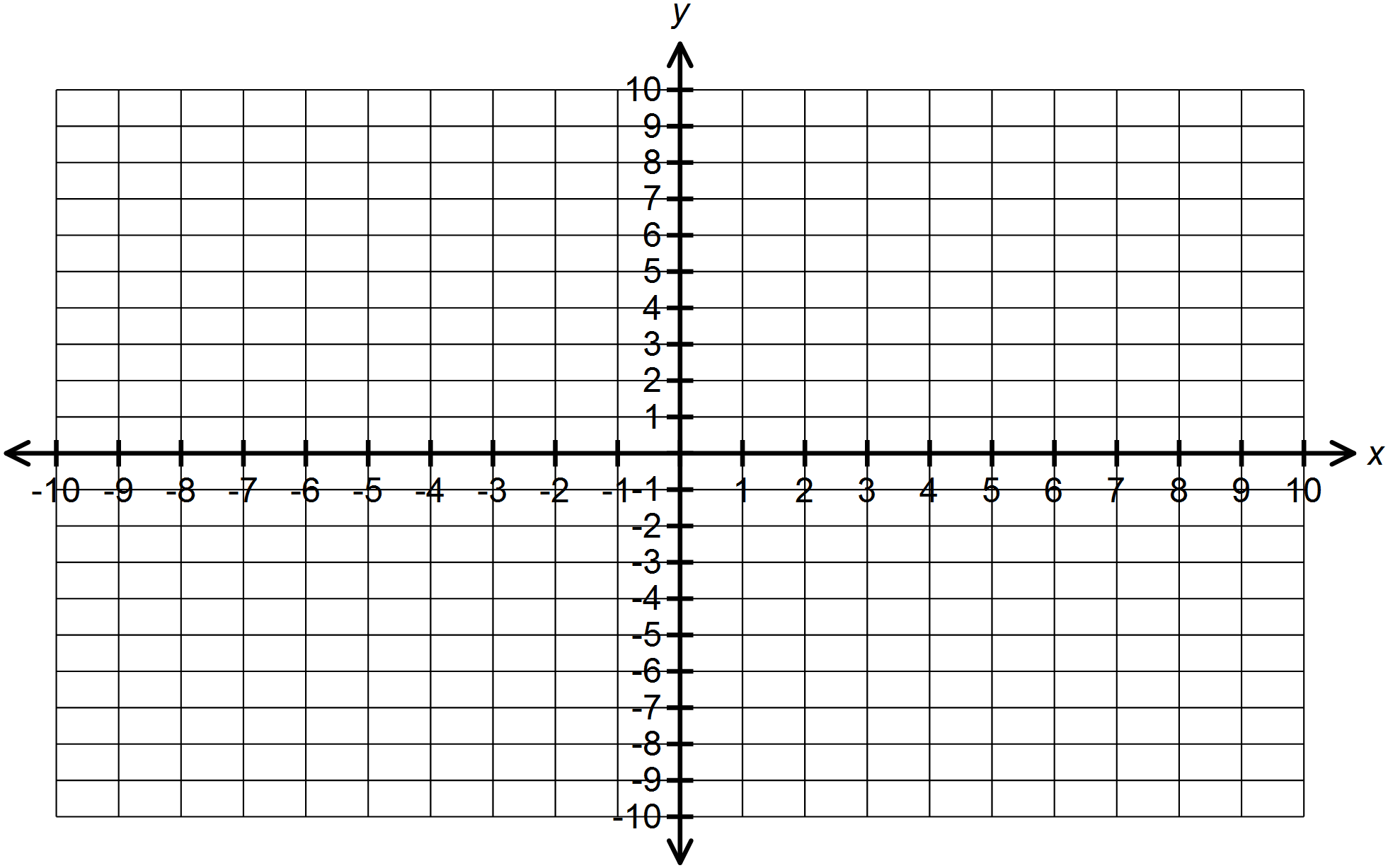




5. The graph of with points  is transformed so that

. Plot the points and determine the equation of the image

function in the form . **(4 marks)**

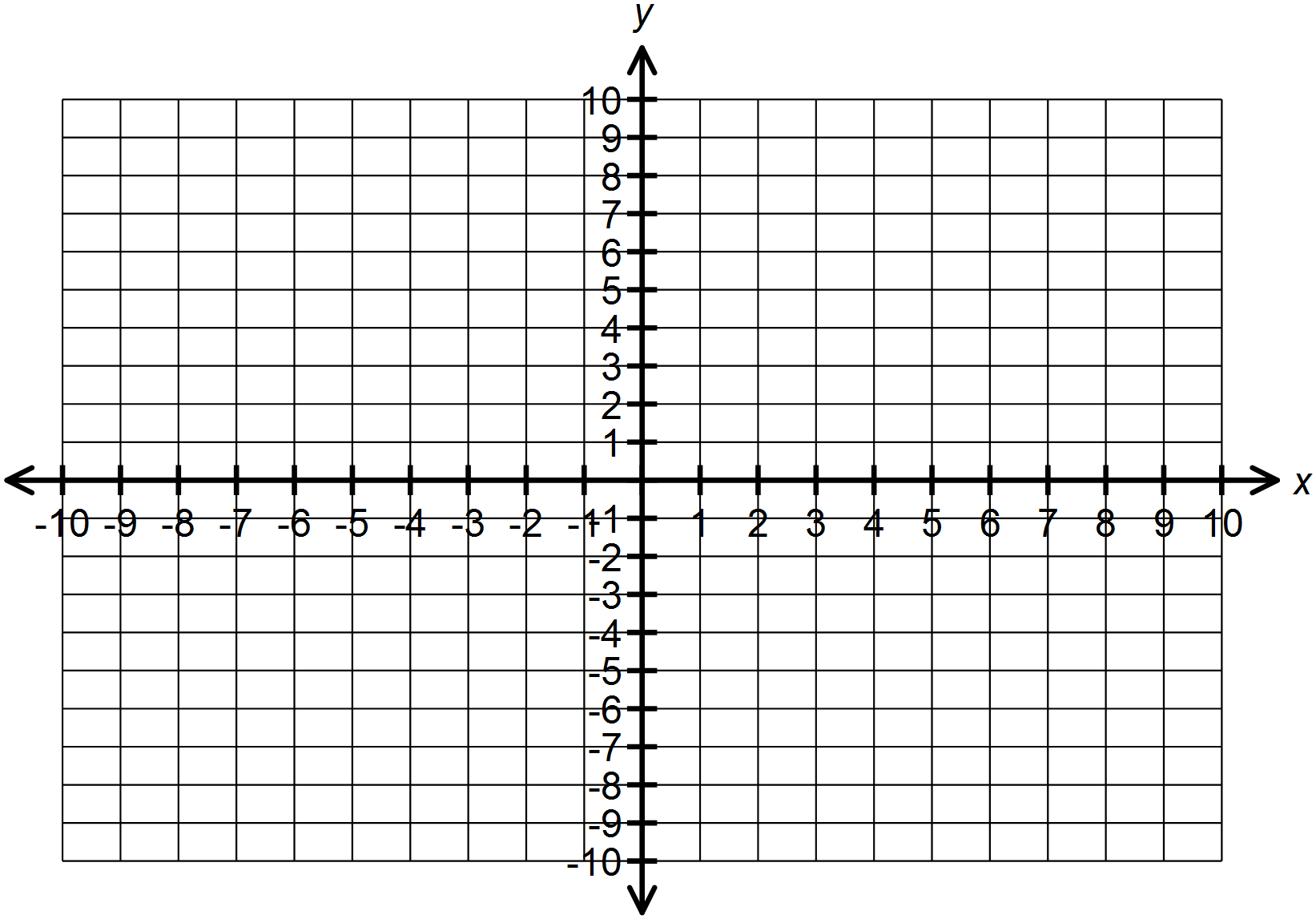


6. If , what is the **Domain** and **Range** of ? **(2 marks)**

7. If , find  and restrict the domain so that is a function. **(3 marks)**

8. Solve graphically  **(3 marks)**

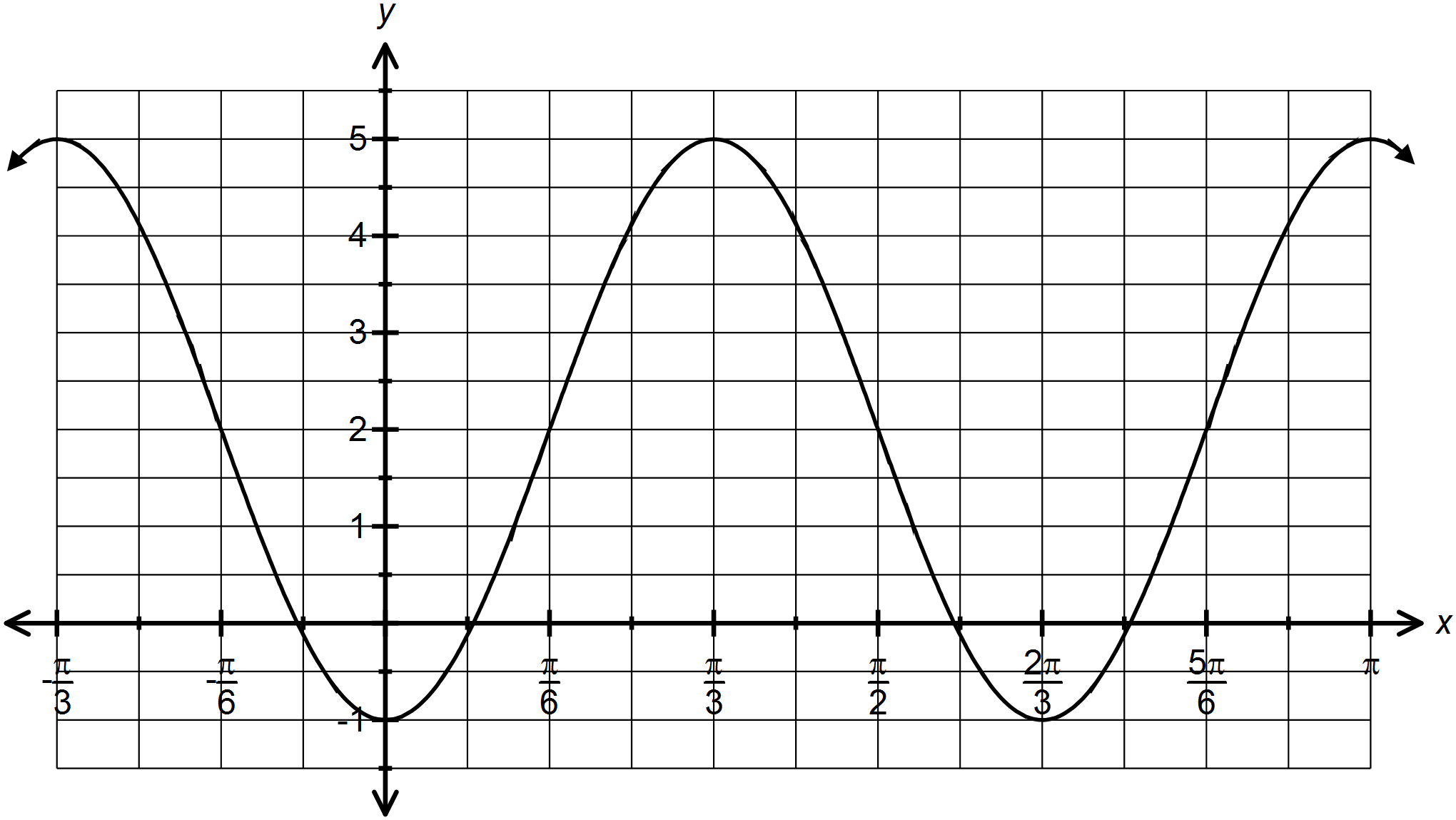
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| X | Y |  | X | Y |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |



9. Find the **exact** value for  **(3 marks)**

10. Solve for :  **(4 marks)**

11. Write the equation in the form to represent the function graphed below. **(2 marks)**

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12. Solve:  ** (4 marks)**