

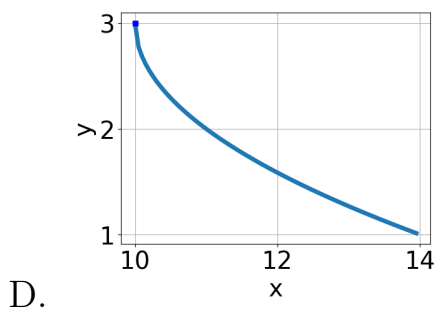
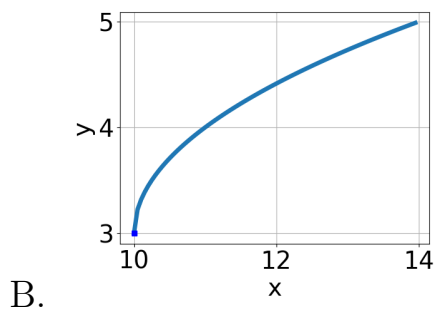
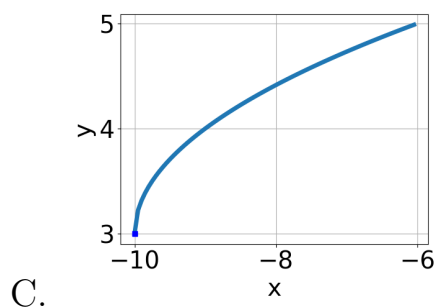
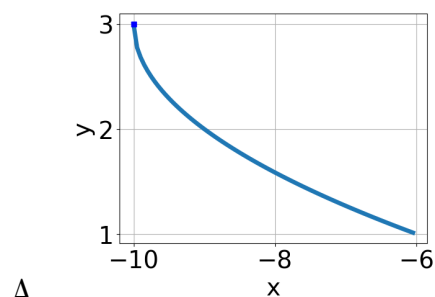
1. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form  $ax^3 + bx^2 + cx + d$ .

$$4, \frac{2}{3}, \text{ and } \frac{1}{4}$$

- A.  $a \in [11, 20], b \in [-64, -52], c \in [37, 51], \text{ and } d \in [6, 12]$   
 B.  $a \in [11, 20], b \in [35, 42], c \in [-48, -34], \text{ and } d \in [6, 12]$   
 C.  $a \in [11, 20], b \in [57, 67], c \in [37, 51], \text{ and } d \in [6, 12]$   
 D.  $a \in [11, 20], b \in [-64, -52], c \in [37, 51], \text{ and } d \in [-11, -6]$   
 E.  $a \in [11, 20], b \in [51, 57], c \in [16, 20], \text{ and } d \in [-11, -6]$

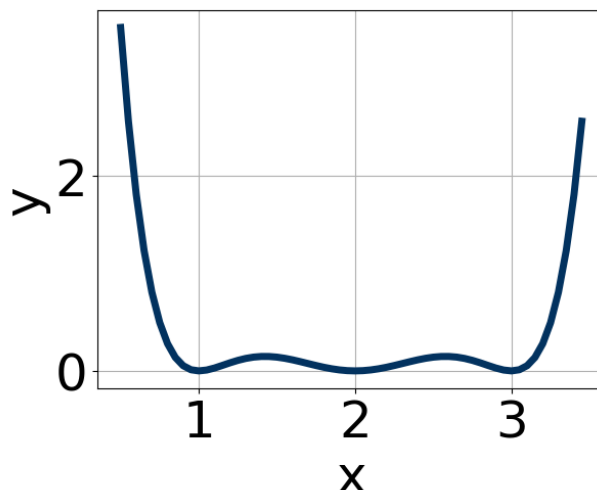
2. Choose the graph of the equation below.

$$f(x) = \sqrt{x + 10} + 3$$



- E. None of the above.

3. Which of the following equations *could* be of the graph presented below?



- A.  $17(x - 2)^8(x - 1)^6(x - 3)^6$
- B.  $13(x - 2)^8(x - 1)^{11}(x - 3)^7$
- C.  $15(x - 2)^4(x - 1)^4(x - 3)^9$
- D.  $-15(x - 2)^{10}(x - 1)^{10}(x - 3)^4$
- E.  $-16(x - 2)^4(x - 1)^6(x - 3)^{11}$

4. Solve the radical equation below. Then, choose the interval(s) that the solution(s) belongs to.

$$\sqrt{-6x - 5} - \sqrt{7x - 9} = 0$$

- A. All solutions lead to invalid or complex values in the equation.
- B.  $x_1 \in [-0.85, -0.54]$  and  $x_2 \in [-0.33, 0.51]$
- C.  $x \in [0.17, 0.34]$
- D.  $x_1 \in [-0.85, -0.54]$  and  $x_2 \in [1.21, 1.84]$
- E.  $x \in [-1.11, -0.91]$

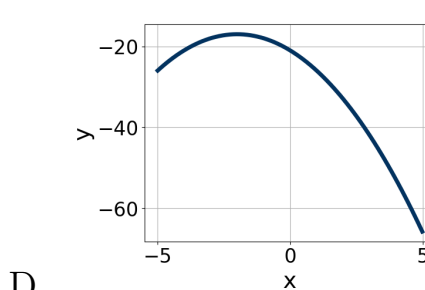
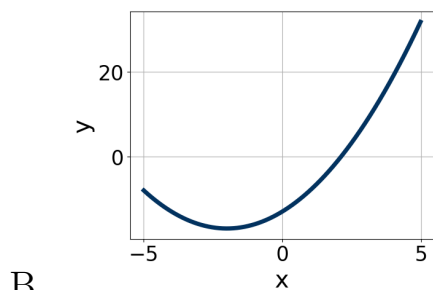
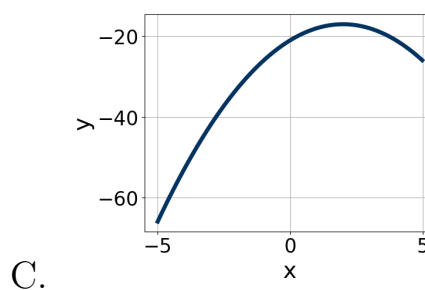
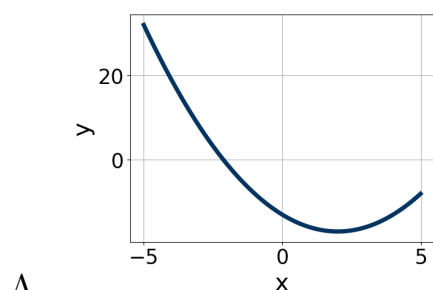
5. Solve the quadratic equation below. Then, choose the intervals that the solutions belong to, with  $x_1 \leq x_2$  (if they exist).

$$-17x^2 + 15x + 9 = 0$$

- A.  $x_1 \in [-0.55, -0.04]$  and  $x_2 \in [1.12, 1.4]$
- B.  $x_1 \in [-2.02, -0.96]$  and  $x_2 \in [-0.21, 0.68]$
- C.  $x_1 \in [-22.28, -21.92]$  and  $x_2 \in [6.79, 7.2]$
- D.  $x_1 \in [-29.75, -28.12]$  and  $x_2 \in [29.32, 29.49]$
- E. There are no Real solutions.

6. Graph the equation below.

$$f(x) = (x + 2)^2 - 17$$



E. None of the above.

7. Find the equation of the line described below. Write the linear equation as  $y = mx + b$  and choose the intervals that contain  $m$  and  $b$ .

Perpendicular to  $5x - 9y = 13$  and passing through the point  $(4, 8)$ .

- A.  $m \in [-3.2, -1.5]$   $b \in [10.2, 17.2]$
- B.  $m \in [-0.9, 0.5]$   $b \in [10.2, 17.2]$
- C.  $m \in [1, 2.1]$   $b \in [-3.2, 2.8]$

D.  $m \in [-3.2, -1.5]$   $b \in [-15.2, -14.2]$

E.  $m \in [-3.2, -1.5]$   $b \in [2, 6]$

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8. What is the domain of the function below?

$$f(x) = \sqrt[7]{-7x + 8}$$

A. The domain is  $(-\infty, a]$ , where  $a \in [0.44, 1.05]$

B. The domain is  $[a, \infty)$ , where  $a \in [0.86, 1]$

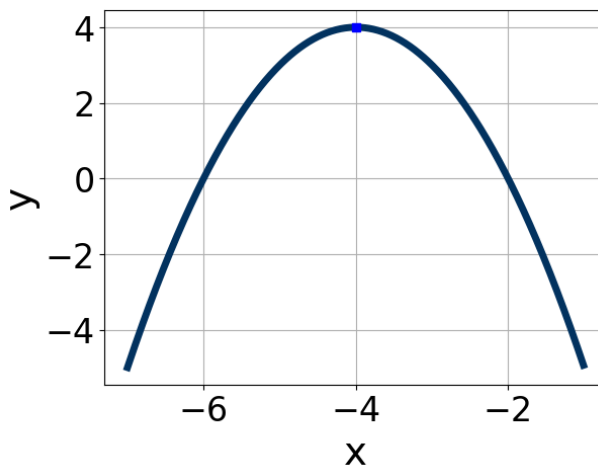
C. The domain is  $[a, \infty)$ , where  $a \in [0.93, 2.03]$

D. The domain is  $(-\infty, a]$ , where  $a \in [0.88, 1.46]$

E.  $(-\infty, \infty)$

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9. Write the equation of the graph presented below in the form  $f(x) = ax^2 + bx + c$ , assuming  $a = 1$  or  $a = -1$ . Then, choose the intervals that  $a, b$ , and  $c$  belong to.



A.  $a \in [-0.6, 1.1]$ ,  $b \in [4, 13]$ , and  $c \in [16, 25]$

B.  $a \in [-2.9, 0.7]$ ,  $b \in [-10, -7]$ , and  $c \in [-12, -8]$

C.  $a \in [-2.9, 0.7]$ ,  $b \in [4, 13]$ , and  $c \in [-12, -8]$

D.  $a \in [-2.9, 0.7]$ ,  $b \in [4, 13]$ , and  $c \in [-20, -18]$

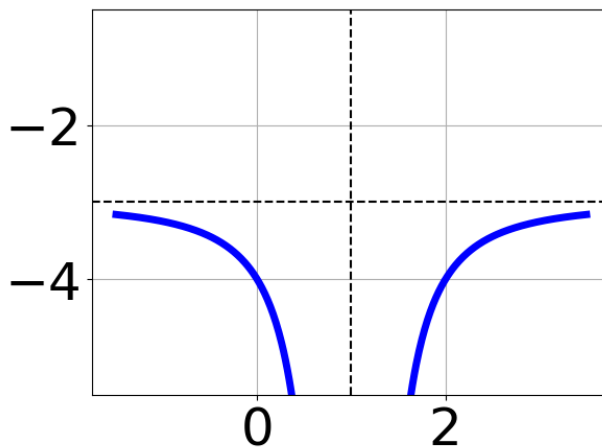
E.  $a \in [-0.6, 1.1]$ ,  $b \in [-10, -7]$ , and  $c \in [16, 25]$

10. Which of the following intervals describes the Range of the function below?

$$f(x) = -\log_2(x - 4) - 8$$

- A.  $(-\infty, a), a \in [7, 14]$   
B.  $[a, \infty), a \in [-4, 3]$   
C.  $(-\infty, a), a \in [-13, -7]$   
D.  $[a, \infty), a \in [-2, 7]$   
E.  $(-\infty, \infty)$

11. Choose the equation of the function graphed below.



- A.  $f(x) = \frac{-1}{x+1} - 3$   
B.  $f(x) = \frac{1}{x-1} - 3$   
C.  $f(x) = \frac{1}{(x-1)^2} - 3$   
D.  $f(x) = \frac{-1}{(x+1)^2} - 3$   
E. None of the above

12. Choose the **smallest** set of Real numbers that the number below belongs to.

$$-\sqrt{\frac{576}{625}}$$

- A. Rational
- B. Whole
- C. Not a Real number
- D. Integer
- E. Irrational

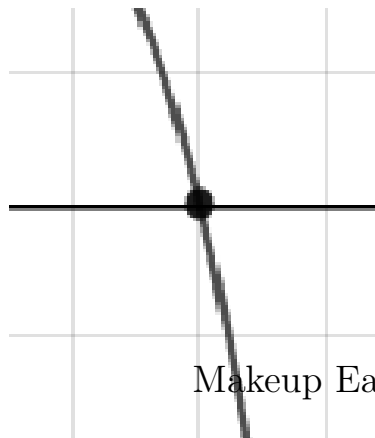
13. Solve the linear equation below. Then, choose the interval that contains the solution.

$$\frac{-9x + 9}{8} - \frac{-9x - 6}{4} = \frac{9x + 8}{5}$$

- A.  $x \in [9.1, 11.7]$
- B.  $x \in [-0.5, 0.6]$
- C.  $x \in [0.6, 3.8]$
- D.  $x \in [-5.9, -2.2]$
- E. There are no real solutions.

14. Describe the zero behavior of the zero  $x = 4$  of the polynomial below.

$$f(x) = -5(x + 4)^8(x - 4)^9(x + 9)^4(x - 9)^5$$



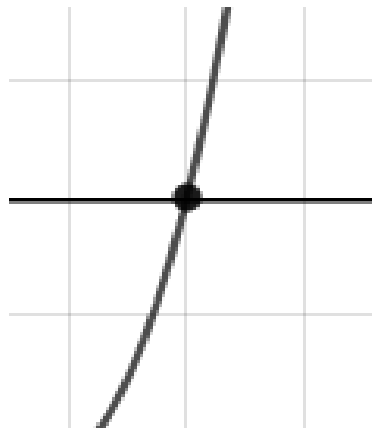
B.



C.



D.



E. None of the above.

15. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-6x + 4 \geq 7x - 3$$

- A.  $[a, \infty)$ , where  $a \in [-1.35, -0.39]$
- B.  $(-\infty, a]$ , where  $a \in [-0.23, 1.19]$
- C.  $[a, \infty)$ , where  $a \in [0.37, 2.04]$
- D.  $(-\infty, a]$ , where  $a \in [-1.81, 0.13]$
- E. None of the above.

16. Simplify the expression below and choose the interval the simplification is contained within.

$$2 - 12^2 + 4 \div 8 * 10 \div 3$$

- A.  $[-142.6, -140.45]$
  - B.  $[-141.71, -139.39]$
  - C.  $[147.49, 149.13]$
  - D.  $[145.93, 146.22]$
  - E. None of the above
- 

17. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{-10}{3} - \frac{7}{7}x > \frac{-4}{9}x - \frac{5}{2}$$

- A.  $(-\infty, a)$ , where  $a \in [-2.5, 0.5]$
  - B.  $(-\infty, a)$ , where  $a \in [1.5, 3.5]$
  - C.  $(a, \infty)$ , where  $a \in [0.5, 3.5]$
  - D.  $(a, \infty)$ , where  $a \in [-1.5, 0.5]$
  - E. None of the above.
- 

18. Solve the rational equation below. Then, choose the interval(s) that the solution(s) belongs to.

$$\frac{-7x}{-6x + 6} + \frac{-7x^2}{36x^2 - 72x + 36} = \frac{2}{-6x + 6}$$

- A.  $x \in [1.12, 1.42]$
- B.  $x_1 \in [-0.37, -0.13]$  and  $x_2 \in [0.86, 1.01]$
- C.  $x \in [0.92, 1.03]$
- D.  $x_1 \in [-0.37, -0.13]$  and  $x_2 \in [1.13, 1.46]$



E. All solutions lead to invalid or complex values in the equation.

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19. Simplify the expression below into the form  $a + bi$ . Then, choose the intervals that  $a$  and  $b$  belong to.

$$\frac{36 + 66i}{5 - 3i}$$

- A.  $a \in [-19, -17.5]$  and  $b \in [12.5, 14]$   
B.  $a \in [-1, 0]$  and  $b \in [437.5, 438.5]$   
C.  $a \in [-1, 0]$  and  $b \in [12.5, 14]$   
D.  $a \in [6.5, 8.5]$  and  $b \in [-22.5, -21.5]$   
E.  $a \in [10.5, 12.5]$  and  $b \in [6, 7.5]$
- 

20. Solve the rational equation below. Then, choose the interval(s) that the solution(s) belongs to.

$$\frac{6}{-7x + 6} + -9 = \frac{-3}{56x - 48}$$

- A.  $x_1 \in [0.6, 0.72]$  and  $x_2 \in [-0.23, 1.77]$   
B.  $x_1 \in [-1.02, -0.9]$  and  $x_2 \in [-0.23, 1.77]$   
C. All solutions lead to invalid or complex values in the equation.  
D.  $x \in [-1.02, -0.9]$   
E.  $x \in [0.77, 3.77]$
- 

21. Solve the equation for  $x$  and choose the interval that contains the solution (if it exists).

$$3^{5x+3} = 16^{3x-4}$$

- A.  $x \in [3.09, 6.09]$   
B.  $x \in [-0.52, 4.48]$

- C.  $x \in [-4.5, -0.5]$
  - D.  $x \in [-10.19, -6.19]$
  - E. There is no Real solution to the equation.
- 

22. Which of the following intervals describes the Range of the function below?

$$f(x) = e^{x-1} - 8$$

- A.  $(a, \infty), a \in [-11, -7]$
  - B.  $[a, \infty), a \in [-11, -7]$
  - C.  $(-\infty, a], a \in [8, 11]$
  - D.  $(-\infty, a), a \in [8, 11]$
  - E.  $(-\infty, \infty)$
- 

23. First, find the equation of the line containing the two points below. Then, write the equation as  $y = mx + b$  and choose the intervals that contain  $m$  and  $b$ .

$$(-7, 11) \text{ and } (9, 3)$$

- A.  $m \in [-1.2, -0.2] \quad b \in [-7, -2]$
  - B.  $m \in [-1.2, -0.2] \quad b \in [17, 22]$
  - C.  $m \in [-1.2, -0.2] \quad b \in [-7.5, -6.5]$
  - D.  $m \in [-1.2, -0.2] \quad b \in [5.5, 9.5]$
  - E.  $m \in [-0.4, 3.2] \quad b \in [-3.5, 6.5]$
- 

24. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-6 + 7x < \frac{33x - 3}{4} \leq -3 + 6x$$

- A.  $(-\infty, a] \cup (b, \infty)$ , where  $a \in [-4.2, -3.2]$  and  $b \in [-2.6, -0.1]$

- B.  $(a, b]$ , where  $a \in [-6.2, -1.2]$  and  $b \in [-1.7, -0.7]$
  - C.  $[a, b)$ , where  $a \in [-4.2, -3.2]$  and  $b \in [-4, 0]$
  - D.  $(-\infty, a) \cup [b, \infty)$ , where  $a \in [-4.2, -0.2]$  and  $b \in [-1, 0]$
  - E. None of the above.
-