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

$$20x^2 + 11x - 7 = 0$$

A. $x_1 \in [-18.62, -18.1]$ and $x_2 \in [6, 9.2]$

B. $x_1 \in [-27.46, -25.76]$ and $x_2 \in [24.2, 25.9]$

C. $x_1 \in [-1.32, -0.43]$ and $x_2 \in [-0.6, 0.8]$

D. $x_1 \in [-0.58, -0.17]$ and $x_2 \in [0.4, 1.1]$

E. There are no Real solutions.

---

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

$$\frac{-4}{8} + \frac{5}{6}x \geq \frac{9}{7}x - \frac{7}{4}$$

A. $[a, \infty)$, where $a \in [-4, 0]$

B. $[a, \infty)$, where $a \in [-2, 6]$

C. $(-\infty, a]$, where $a \in [-6, 1]$

D. $(-\infty, a]$, where $a \in [2, 4]$

E. None of the above.

---

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

$$\sqrt{\frac{14}{0}}$$

A. Irrational

B. Rational

C. Whole

D. Not a Real number

E. Integer

---

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

$$f(x) = e^{x+7} - 7$$

A. $(-\infty, a), a \in [1, 10]$

B. $[a, \infty), a \in [-8, -6]$

C. $(a, \infty), a \in [-8, -6]$

D. $(-\infty, a], a \in [1, 10]$

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

---

5. What is the domain of the function below?

$$f(x) = \sqrt[7]{3x + 8}$$

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

B. The domain is $[a, \infty)$, where $a \in [-0.6, 0.8]$

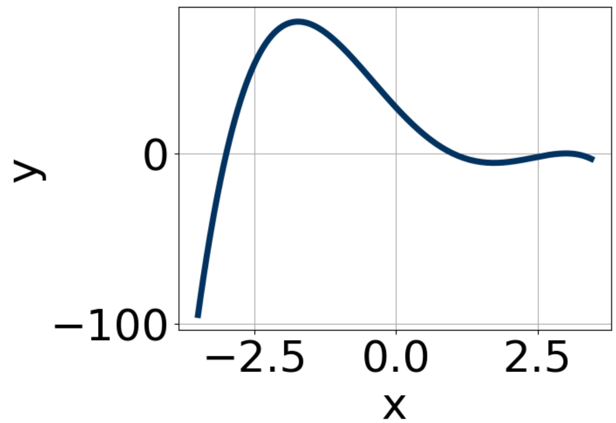
C. The domain is $(-\infty, a]$, where $a \in [-3.1, -1.3]$

D. The domain is $[a, \infty)$, where $a \in [-3.5, -1.8]$

E. The domain is $(-\infty, a]$, where $a \in [-1.5, 1.2]$

---

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



A. $13(x-3)^8(x+3)^7(x-1)^8$

B. $-7(x-3)^4(x+3)^9(x-1)^5$

C. $-8(x-3)^6(x+3)^4(x-1)^7$

D. $-20(x-3)^5(x+3)^{10}(x-1)^5$

E. $18(x-3)^6(x+3)^5(x-1)^{11}$

---

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

$$4x + 10 \geq 10x + 6$$

A. $[a, \infty)$, where $a \in [-0.31, 0.9]$

B. $(-\infty, a]$, where $a \in [-1.6, 0.4]$

C. $[a, \infty)$, where $a \in [-0.94, 0.66]$

D. $(-\infty, a]$, where $a \in [0.1, 4.4]$

E. None of the above.

---

8. 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 $7x - 3y = 9$ and passing through the point $(-3, -9)$.

A. $m \in [-3.36, -0.84]$ $b \in [-12.1, -9.3]$

B. $m \in [-1.13, -0.29]$ $b \in [10, 12.6]$

C. $m \in [-1.13, -0.29]$ $b \in [-12.1, -9.3]$

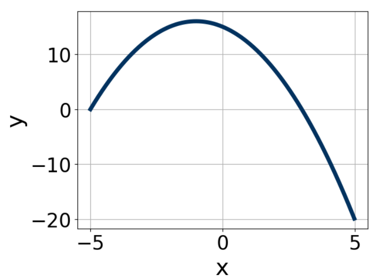
D. $m \in [0.33, 0.6]$ $b \in [-8.7, -6.7]$

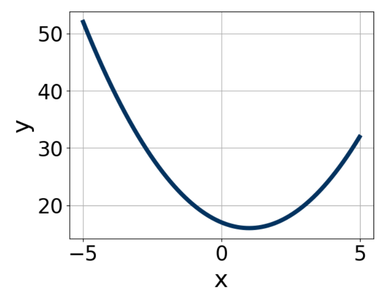
E. $m \in [-1.13, -0.29]$ $b \in [-6.3, -3.6]$

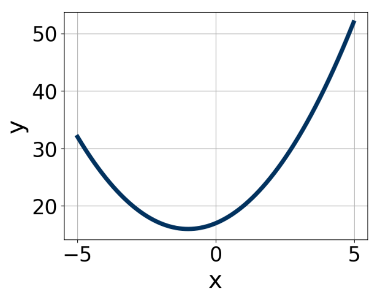
---

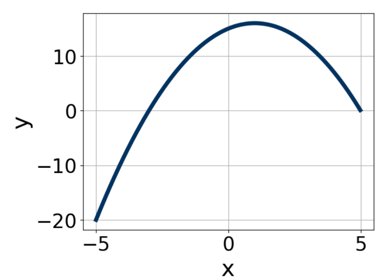
9. Graph the equation below.

$$f(x) = (x-1)^2 + 16$$

A. 

C. 

B. 

D. 

E. None of the above.

---

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

$$-5 - 3x < \frac{-16x - 4}{7} \leq 9 - 6x$$

A. $(-\infty, a) \cup [b, \infty)$, where $a \in [2, 7]$ and $b \in [-5, -2]$

B. $(a, b]$, where $a \in [2, 9]$ and $b \in [-8, -2]$

C. $[a, b)$, where $a \in [3, 10]$ and $b \in [-3, 1]$

D. $(-\infty, a] \cup (b, \infty)$, where $a \in [4, 9]$ and $b \in [-7, -1]$

E. None of the above.

---

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

$$\frac{-6x-4}{7} - \frac{3x-3}{2} = \frac{-5x-6}{4}$$

A. $x \in [0.4, 0.8]$

B. $x \in [1.7, 3.4]$

C. $x \in [4, 4.9]$

D. $x \in [-1.4, -0.4]$

E. There are no real solutions.

---

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

$$5^{4x-5} = \left(\frac{1}{9}\right)^{-3x+5}$$

A. $x \in [-2, 1]$

B. $x \in [0, 4]$

C. $x \in [-66, -62]$

D. $x \in [17, 24]$

E. There is no Real solution to the equation.

---

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

$$\frac{63 + 66i}{-1 + 2i}$$

A. $a \in [-40.5, -38.5]$ and $b \in [11.5, 13]$

B. $a \in [68, 69.5]$ and $b \in [-39.5, -37]$

C. $a \in [13.5, 14]$ and $b \in [-193, -191.5]$

D. $a \in [13.5, 14]$ and $b \in [-39.5, -37]$

E. $a \in [-63.5, -62]$ and $b \in [31.5, 33.5]$

---

14. 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.

$$(7, -5) \text{ and } (-6, -9)$$

A. $m \in [0.21, 0.43]$ $b \in [-7.8, -6.6]$

B. $m \in [0.21, 0.43]$ $b \in [-12.8, -11.7]$

C. $m \in [-0.96, -0.22]$ $b \in [-11.3, -10.2]$

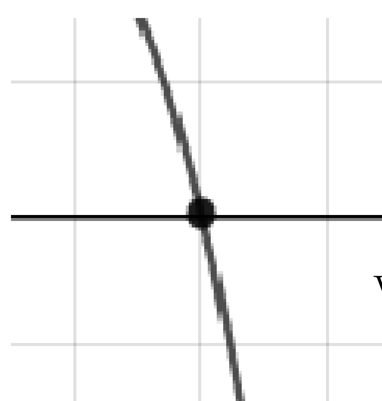
D. $m \in [0.21, 0.43]$ $b \in [-4.2, -2.6]$

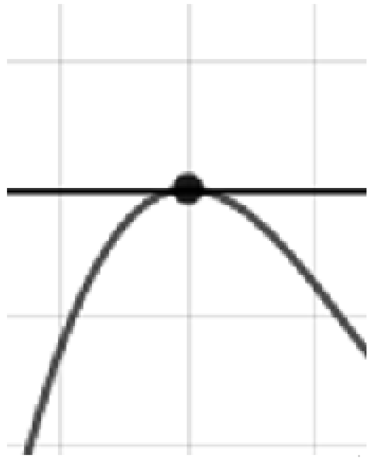
E. $m \in [0.21, 0.43]$ $b \in [5.1, 9.1]$

---

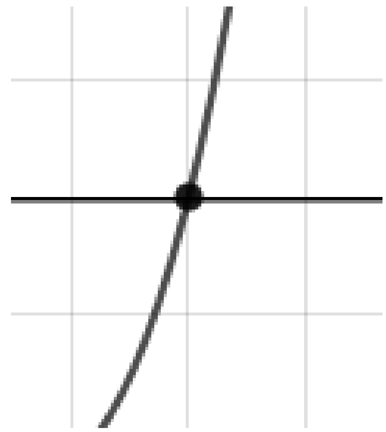
15. Describe the zero behavior of the zero $x = -4$ of the polynomial below.

$$f(x) = 8(x + 7)^{12}(x - 7)^{8}(x + 4)^{6}(x - 4)^{3}$$



B. 

C. 

D. 

E. None of the above.

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

$$\frac{6x}{2x-6} + \frac{-3x^2}{8x^2-38x+42} = \frac{-4}{4x-7}$$

A. $x \in [2, 2.51]$

B. $x \in [1.69, 1.91]$

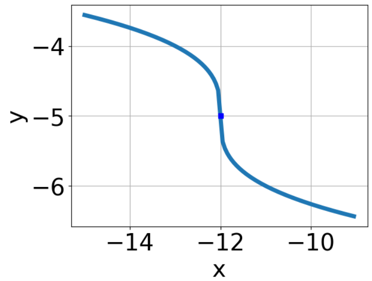
C. $x_1 \in [-0.67, -0.07]$ and $x_2 \in [0.44, 2.6]$

D. $x_1 \in [-0.67, -0.07]$ and $x_2 \in [2.86, 4.6]$

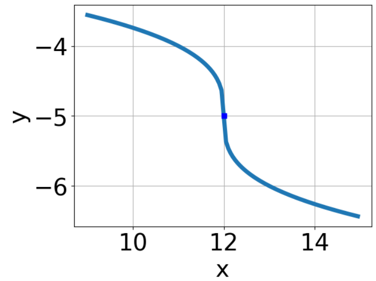
E. All solutions lead to invalid or complex values in the equation.

17. Choose the graph of the equation below.

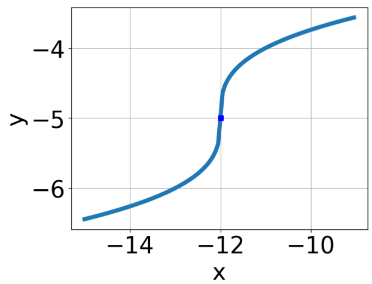
$$f(x) = \sqrt[3]{x+12} - 5$$



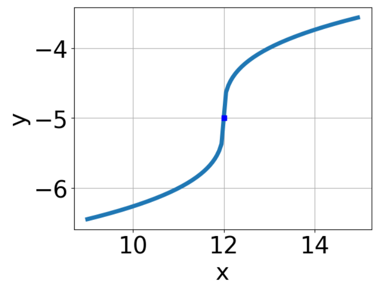
A.



C.



B.

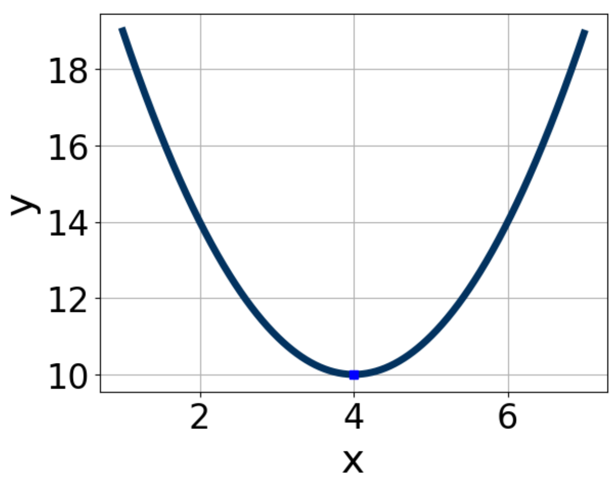


D.

E. None of the above.

---

18. 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. $a \in [0.9, 2.3], \quad b \in [6, 14], \text{ and } \quad c \in [25, 28]$

B. $a \in [-2, 0], \quad b \in [6, 14], \text{ and } \quad c \in [-9, -4]$

C. $a \in [-2, 0], \quad b \in [-12, -5], \text{ and } \quad c \in [-9, -4]$

D. $a \in [0.9, 2.3], \quad b \in [6, 14], \text{ and } \quad c \in [2, 9]$

E. $a \in [0.9, 2.3], \quad b \in [-12, -5], \text{ and } \quad c \in [25, 28]$

---

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

$$\frac{-4}{3}, -6, \text{ and } \frac{-2}{3}$$

A. $a \in [5, 13], b \in [42, 58], c \in [-48, -40], \text{ and } d \in [-53, -42]$

B. $a \in [5, 13], b \in [65, 77], c \in [108, 129], \text{ and } d \in [-53, -42]$

C. $a \in [5, 13], b \in [-65, -58], c \in [22, 31], \text{ and } d \in [42, 53]$

D. $a \in [5, 13], b \in [-75, -64], c \in [108, 129], \text{ and } d \in [-53, -42]$

E. $a \in [5, 13], b \in [65, 77], c \in [108, 129], \text{ and } d \in [42, 53]$

---

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

$$f(x) = -\log_2(x - 5) + 8$$

A. $[a, \infty), a \in [-5.3, -2.2]$

B. $(-\infty, a), a \in [6.7, 9]$

C. $[a, \infty), a \in [3.5, 7.8]$

D. $(-\infty, a), a \in [-10.3, -5.4]$

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

---

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

$$\sqrt{-5x+3} - \sqrt{-8x-6} = 0$$

A. $x \in [0.3, 3.3]$

B. $x \in [-3.2, -1.8]$

C. $x_1 \in [-3.2, -1.8]$ and $x_2 \in [-3, 8]$

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

E. $x_1 \in [-1.3, -0.3]$ and $x_2 \in [-3, 8]$

---

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

$$19 - 8 \div 14 * 10 - (1 * 11)$$

A. $[132, 139]$

B. $[7, 10]$

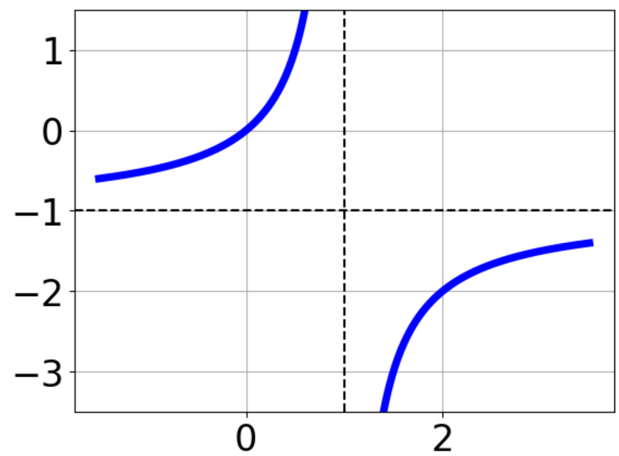
C. $[28, 35]$

D. $[1, 7]$

E. None of the above

---

23. Choose the equation of the function graphed below.



A. $f(x) = \dfrac{1}{(x+1)^2} - 1$

B. $f(x) = \dfrac{1}{x+1} - 1$

C. $f(x) = \dfrac{-1}{x-1} - 1$

D. $f(x) = \dfrac{-1}{(x-1)^2} - 1$

E. None of the above

---

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

$$\frac{-3x+8}{4} - \frac{4x-9}{5} = \frac{-4x-7}{3}$$

A. $x \in [25, 30]$

B. $x \in [110, 113]$

C. $x \in [1, 3]$

D. $x \in [10, 15]$

E. There are no real solutions.
