21. What is the domain of the function below?

$$f(x) = \sqrt[7]{6x - 7}$$

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

B. The domain is $(-\infty, a]$, where $a \in [0.75, 1.08]$

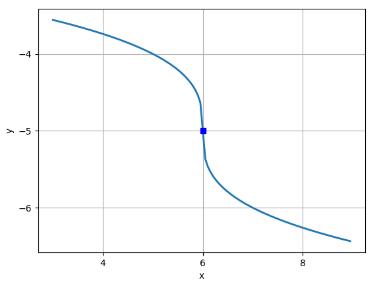
C. The domain is $[a, \infty)$, where $a \in [0.38, 0.97]$

D. The domain is $[a, \infty)$, where $a \in [1.09, 1.27]$

E. The domain is $(-\infty, a]$, where $a \in [1.12, 1.25]$

---

22. Choose the equation of the function graphed below.



A. $f(x) = -\sqrt[3]{x - 6} - 5$

B. $f(x) = \sqrt[3]{x - 6} - 5$

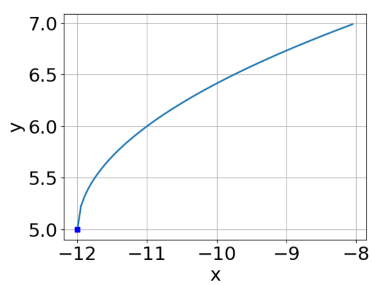
C. $f(x) = \sqrt[3]{x + 6} - 5$

D. $f(x) = -\sqrt[3]{x + 6} - 5$

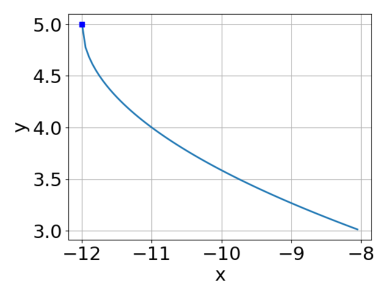
---

23. Choose the graph of the equation below.

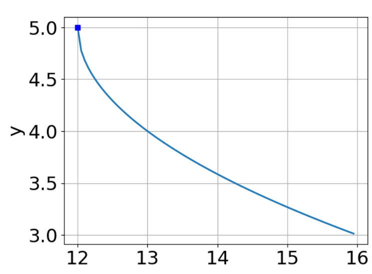
$$f(x) = -\sqrt{x + 12} + 5$$



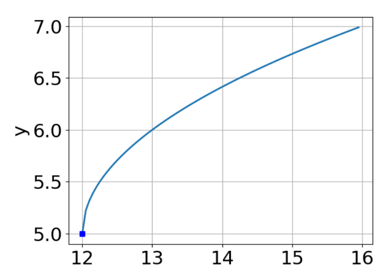
A.



C.



B.



D.

---

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

$$\sqrt{-9x-6} - \sqrt{3x-7} = 0$$

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

B. $x \in [0.05, 0.28]$

C. $x_1 \in [0.05, 0.28]$ and $x_2 \in [-1, 7]$

D. $x \in [-0.45, 0.05]$

E. $x_1 \in [0.05, 0.28]$ and $x_2 \in [10, 15]$

---

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

$$\sqrt{-9x^2+16} - \sqrt{18x} = 0$$

A. $x \in [0.1, 1.4]$

B. $x \in [-3.3, -0.8]$

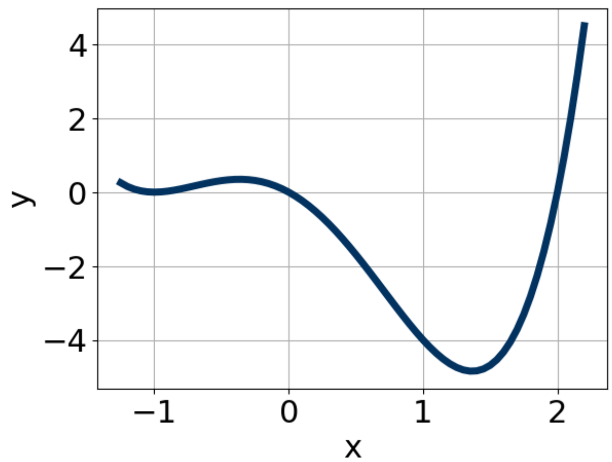
C. $x_1 \in [-3.3, -0.8]$ and $x_2 \in [-4, 2]$

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

E. $x_1 \in [1.1, 3]$ and $x_2 \in [-4, 2]$

---

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



A. $x(x-2)(x+1)^2$

B. $-x^2(x-2)(x+1)^2$

C. $-x(x-2)(x+1)^2$

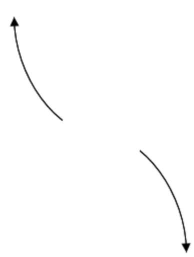
D. $x(x-2)^2(x+1)^2$

E. $x(x-2)^2(x+1)$

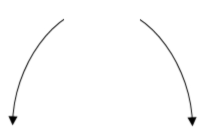
---

27. Choose the end behavior of the polynomial below.

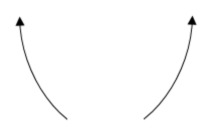
$$f(x) = -9(x-6)^4(x-5)^7(x+5)^5(x+6)^9$$



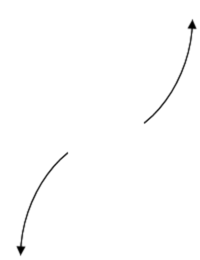
A.



B.



C.

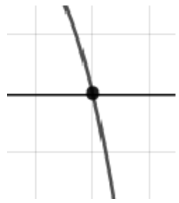


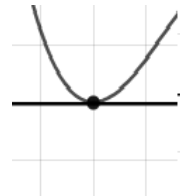
D.

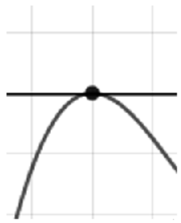
---

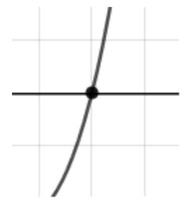
28. Describe the zero behavior of the zero 6 of the polynomial below.

$$f(x) = -9(x-6)^4(x-5)^7(x+5)^5(x+6)^9$$

A. 

C. 

B. 

D. 

---

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

$$\frac{6}{5}, \frac{-7}{3}, -5$$

A. $a \in [9, 17], b \in [81, 95], c \in [39, 48],$ and $d \in [207, 216]$

B. $a \in [9, 17], b \in [81, 95], c \in [39, 48],$ and $d \in [-214, -206]$

C. $a \in [9, 17], b \in [-94, -86], c \in [39, 48],$ and $d \in [207, 216]$

D. $a \in [9, 17], b \in [120, 135], c \in [300, 311],$ and $d \in [207, 216]$

E. $a \in [9, 17], b \in [52, 62], c \in [-134, -124],$ and $d \in [-214, -206]$

---

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

$3i$ and 2

A. $b \in [1.96, 3.14], c \in [-10.3, -5.2],$ and $d \in [13, 22]$

B. $b \in [-0.43, 1.18], c \in [-5.3, -3.7],$ and $d \in [5, 9]$

C. $b \in [-0.43, 1.18], c \in [-3.8, 0.6],$ and $d \in [-5, 4]$

D. $b \in [-2.57, -0.67], c \in [8.2, 13],$ and $d \in [-21, -11]$

E. $b \in [1.96, 3.14], c \in [8.2, 13],$ and $d \in [13, 22]$

31. Determine the domain of the function below.

$$f(x) = \frac{3}{18x^2 - 24x - 24}$$

A. All Real numbers except $x = a$, where $a \in [-4, 0]$

B. All Real numbers except $x = a$, where $a \in [-26, -22]$

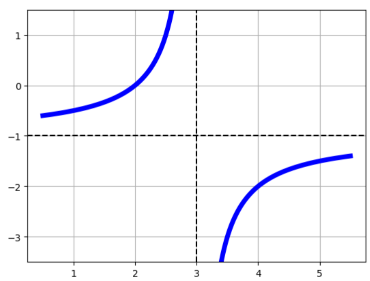
C. All Real numbers except $x = a$ and $x = b$, where $a \in [-26, -22]$ and $b \in [17, 20]$

D. All Real numbers.

E. All Real numbers except $x = a$ and $x = b$, where $a \in [-4, 0]$ and $b \in [0, 4]$

---

32. Choose the equation of the function graphed below.



A. $f(x) = \frac{-1}{x - 3} - 1$

B. $f(x) = \frac{1}{x + 3} - 1$

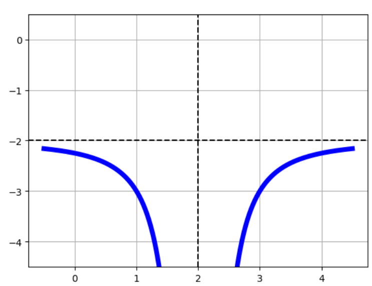
C. $f(x) = \frac{1}{(x + 3)^2} - 1$

D. $f(x) = \frac{-1}{(x - 3)^2} - 1$

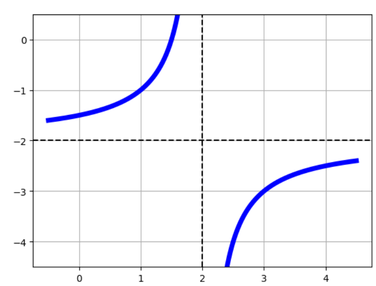
---

33. Choose the graph of the equation below.

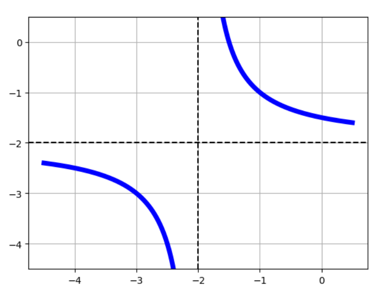
$$f(x) = \frac{1}{x + 2} - 2$$



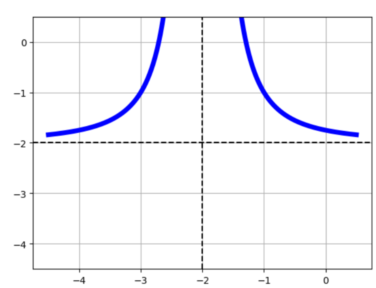
A.



C.



B.



D.

---

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

$$9 - \frac{5}{5x-6} = \frac{7}{-30x+36}$$

A. $x_1 \in [-1.83, -0.96]$ and $x_2 \in [-1, 3]$

B. $x_1 \in [1.36, 1.95]$ and $x_2 \in [-1, 3]$

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

D. $x \in [-1.83, -0.96]$

E. $x \in [0.88, 1.46]$

---

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

$$\frac{7x}{-5x+4} - \frac{4x^2}{20x^2-6x-8} = -\frac{3}{-4x-2}$$

A. $x \in [-1.08, -0.69]$

B. $x_1 \in [0.14, 0.37]$ and $x_2 \in [-0.3, 2.9]$

C. $x \in [-1.45, -1.17]$

D. $x_1 \in [0.14, 0.37]$ and $x_2 \in [-1.7, -0.6]$

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

---

36. Which of the following intervals describes the Domain of the function below?

$$f(x) = \log_2(x+9) + 5$$

A. $(-\infty, a), a \in [8, 10.1]$

B. $[a, \infty), a \in [-6.1, -3.2]$

C. $(a, \infty), a \in [-9.3, -8.8]$

D. $(-\infty, a], a \in [3.2, 7.1]$

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

---

37. Which of the following intervals describes the Domain of the function below?

$$f(x) = e^{x+6} - 9$$

A. $(a, \infty), a \in [8, 15]$

B. $(-\infty, a), a \in [-12, -8]$

C. $(-\infty, a], a \in [-12, -8]$

D. $[a, \infty), a \in [8, 15]$

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

---

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

$$\log_2(3x+8) + 6 = 3$$

A. $x \in [4.62, 5.96]$

B. $x \in [-0.48, 0.23]$

C. $x \in [0.11, 0.47]$

D. $x \in [-3.09, -2.47]$

E. There is no Real solution to the equation.

---

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

$$11 = \ln \sqrt{\frac{20}{e^x}}$$

A. $x \in [13, 21]$

B. $x \in [-13, -8]$

C. $x \in [-21, -17]$

D. $x \in [5, 12]$

E. There is no solution to the equation.

---

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

$$2^{4x-5} = \left(\frac{1}{25}\right)^{2x+3}$$

A. $x \in [-1.2, -0.4]$

B. $x \in [-19.2, -18.4]$

C. $x \in [0.6, 2.9]$

D. $x \in [21, 23.5]$

E. There is no Real solution to the equation.
