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

$$\frac{18 - 33i}{1 + 8i}$$

A. $a \in [-246.5, -245]$ and $b \in [-4, -1.5]$

B. $a \in [-4.5, -3.5]$ and $b \in [-178.5, -176.5]$

C. $a \in [4, 4.5]$ and $b \in [1.5, 3.5]$

D. $a \in [17, 19]$ and $b \in [-4.5, -4]$

E. $a \in [-4.5, -3.5]$ and $b \in [-4, -1.5]$

---

2. 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 $7x + 5y = 5$ and passing through the point $(-8, 7)$.

A. $m \in [0.55, 1.32]$ $b \in [13, 21]$

B. $m \in [0.55, 1.32]$ $b \in [-16, -10]$

C. $m \in [0.55, 1.32]$ $b \in [12, 14]$

D. $m \in [-0.99, 0.04]$ $b \in [-2, 5]$

E. $m \in [1.01, 2.22]$ $b \in [12, 14]$

---

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

$$6 - 3 \div 17 * 9 - (10 * 12)$$

A. $[-114.2, -113.9]$

B. $[124.2, 127.4]$

C. $[-67.5, -64.7]$

D. $[-116.6, -114.5]$

E. None of the above

---

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

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

A. $x \in [-3, -1.4]$

B. $x \in [-39.8, -38.7]$

C. $x \in [-4.6, -3.1]$

D. $x \in [-7.9, -7.6]$

E. There are no real solutions.

---

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

$$-11x^2 + 15x + 7 = 0$$

A. $x_1 \in [-2.34, -1.57]$ and $x_2 \in [0.1, 0.9]$

B. $x_1 \in [-19.57, -18.54]$ and $x_2 \in [3.8, 4.4]$

C. $x_1 \in [-1.54, 0.33]$ and $x_2 \in [1.2, 2.6]$

D. $x_1 \in [-23.17, -22.37]$ and $x_2 \in [23.1, 24.3]$

E. There are no Real solutions.

---

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

$$f(x) = e^{x-8} + 5$$

A. $(a, \infty), a \in [-8, -2]$

B. $(-\infty, a], a \in [1, 13]$

C. $(-\infty, a), a \in [1, 13]$

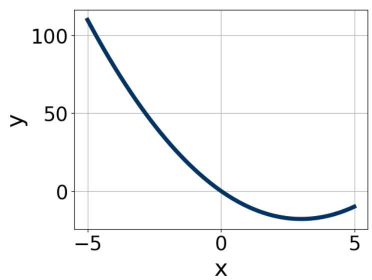
D. $[a, \infty), a \in [-8, -2]$

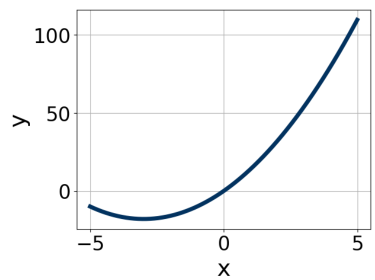
E. $(-\infty, \infty)$

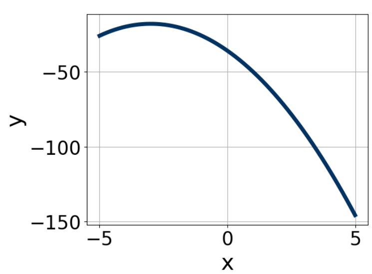
---

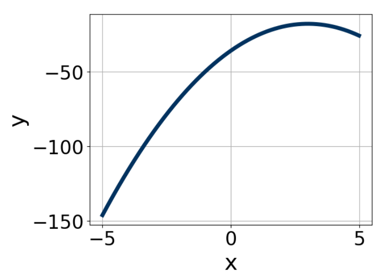
7. Graph the equation below.

$$f(x) = (x+3)^2 - 18$$

A. 

C. 

B. 

D. 

E. None of the above.

---

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

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

A. $x \in [0.89, 1.06]$

B. $x \in [-1.41, 0.38]$

C. $x \in [-5.68, -4.94]$

D. $x \in [-1.96, -0.45]$

E. There are no real solutions.

---

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

$$\frac{6}{5}, -3, \text{ and } \frac{3}{5}$$

A. $a \in [19, 29], b \in [26, 36], c \in [-123, -114], \text{ and } d \in [49, 58]$

B. $a \in [19, 29], b \in [26, 36], c \in [-123, -114], \text{ and } d \in [-55, -48]$

C. $a \in [19, 29], b \in [84, 91], c \in [22, 29], \text{ and } d \in [-55, -48]$

D. $a \in [19, 29], b \in [-37, -25], c \in [-123, -114], \text{ and } d \in [-55, -48]$

E. $a \in [19, 29], b \in [-69, -58], c \in [-64, -62], \text{ and } d \in [49, 58]$

---

10. 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.

$$(-5, -10) \text{ and } (-9, -4)$$

A. $m \in [-2, -1] \quad b \in [17, 23]$

B. $m \in [-2, -1] \quad b \in [-8, -3]$

C. $m \in [-2, -1] \quad b \in [4, 6]$

D. $m \in [0, 3] \quad b \in [8, 14]$

E. $m \in [-2, -1] \quad b \in [-22, -16]$

---

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

$$\frac{-7}{7} - \frac{3}{5}x \geq \frac{3}{9}x + \frac{10}{6}$$

A. $[a, \infty)$, where $a \in [-7, -1]$

B. $(-\infty, a]$, where $a \in [-1, 4]$

C. $[a, \infty)$, where $a \in [-2, 5]$

D. $(-\infty, a]$, where $a \in [-4, -1]$

E. None of the above.

---

12. What is the domain of the function below?

$$f(x) = \sqrt[3]{-4x - 9}$$

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

B. The domain is $[a, \infty)$, where $a \in [-3.08, -1.22]$

C. The domain is $(-\infty, a]$, where $a \in [-6.8, -1.2]$

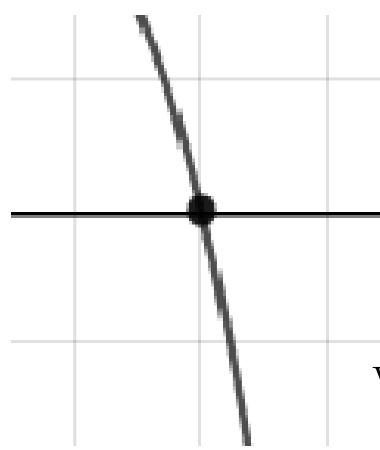
D. The domain is $(-\infty, a]$, where $a \in [-0.5, -0.2]$

E. The domain is $[a, \infty)$, where $a \in [-1.69, 0.29]$

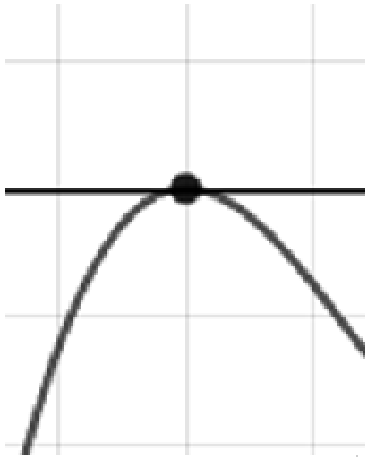
---

13. Describe the zero behavior of the zero $x = -5$ of the polynomial below.

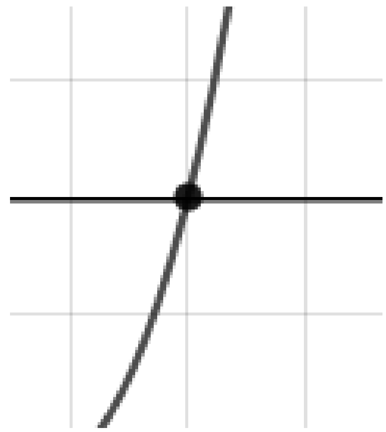
$$f(x) = -4(x+5)^4(x-5)^5(x+7)^3(x-7)^6$$



A.

B. 

C. 

D. 

E. None of the above.

---

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

$$9 - 9x < \frac{-16x - 8}{5} \leq 5 - 4x$$

A. $(-\infty, a) \cup [b, \infty)$, where $a \in [-4.8, -1.8]$ and $b \in [-13, -6]$

B. $[a, b)$, where $a \in [-2, -1]$ and $b \in [-9, -1]$

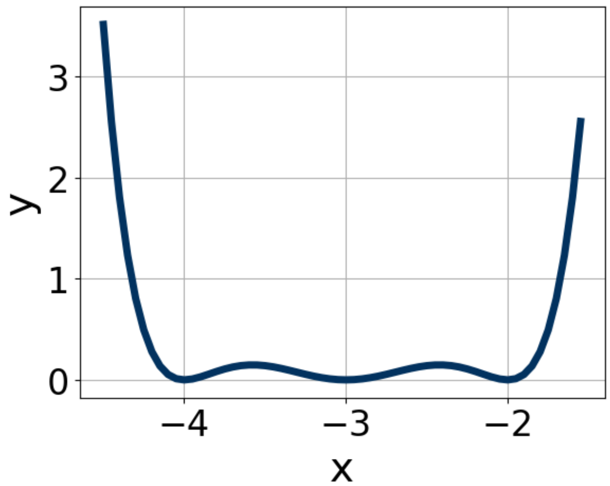
C. $(a, b]$, where $a \in [-3, 0]$ and $b \in [-10, -6]$

D. $(-\infty, a] \cup (b, \infty)$, where $a \in [-4, -1.1]$ and $b \in [-10, -5]$

E. None of the above.

---

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



A. $12(x+2)^6(x+4)^8(x+3)^9$

B. $17(x+2)^4(x+4)^5(x+3)^5$

C. $19(x+2)^8(x+4)^4(x+3)^4$

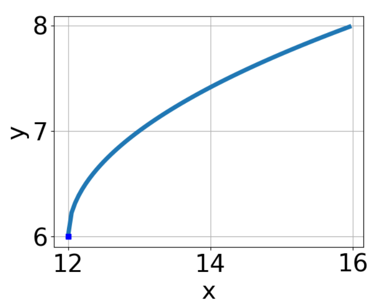
D. $-12(x+2)^{10}(x+4)^{10}(x+3)^8$

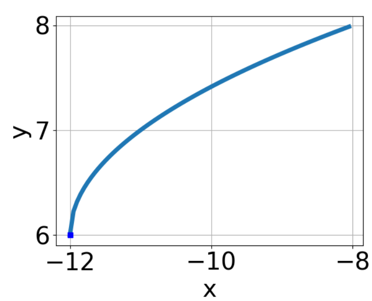
E. $-17(x+2)^4(x+4)^8(x+3)^{11}$

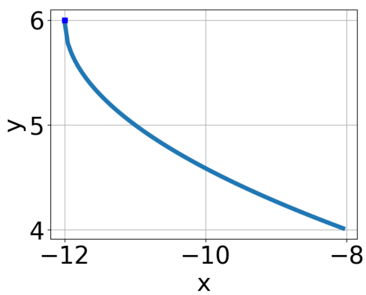
---

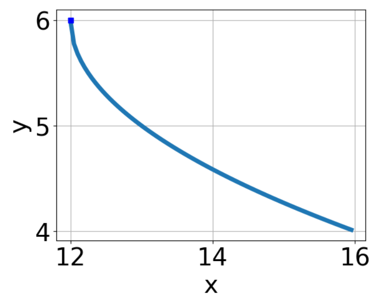
16. Choose the graph of the equation below.

$$f(x) = \sqrt{x-12} + 6$$

A. 

B. 

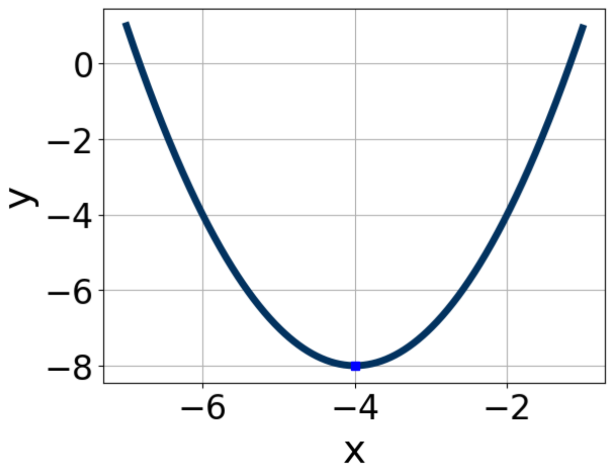
C. 

D. 

E. None of the above.

---

17. 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. $a \in [0.2, 3], \quad b \in [-9, -6],$ and $\quad c \in [23, 29]$

B. $a \in [-2.2, -0.6], \quad b \in [-9, -6],$ and $\quad c \in [-25, -21]$

C. $a \in [0.2, 3], \quad b \in [-9, -6],$ and $\quad c \in [6, 9]$

D. $a \in [0.2, 3], \quad b \in [3, 11],$ and $\quad c \in [6, 9]$

E. $a \in [-2.2, -0.6], \quad b \in [3, 11],$ and $\quad c \in [-25, -21]$

---

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

$$f(x) = -\log_2(x-3) + 7$$

A. $(-\infty, a], a \in [-7.6, -4.5]$

B. $[a, \infty), a \in [6.3, 8.5]$

C. $(a, \infty), a \in [2.6, 3.6]$

D. $(-\infty, a), a \in [-3.4, -2.4]$

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

---

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

$$-\sqrt{\frac{11664}{144}}$$

A. Integer

B. Not a Real number

C. Rational

D. Whole

E. Irrational

---

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

$$4^{-5x+5} = 25^{-2x-5}$$

A. $x \in [19, 21]$

B. $x \in [3, 5]$

C. $x \in [7, 9]$

D. $x \in [44, 48]$

E. There is no Real solution to the equation.

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

$$-6x - 9 < -5x - 5$$

A. (a, ∞), where $a \in [-2, 5]$

B. $(-\infty, a)$, where $a \in [3, 11]$

C. $(-\infty, a)$, where $a \in [-6, -3]$

D. (a, ∞), where $a \in [-9, 3]$

E. None of the above.

---

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

$$\sqrt{-5x - 4} - \sqrt{-8x + 2} = 0$$

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

B. $x \in [0.49, 1.78]$

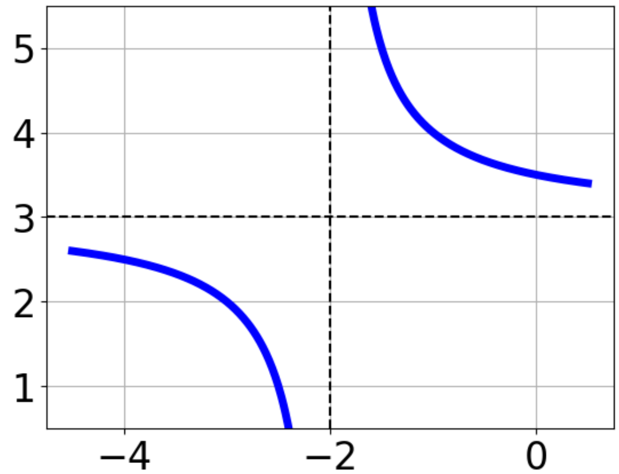
C. $x \in [1.73, 2.77]$

D. $x_1 \in [-0.88, -0.45]$ and $x_2 \in [0.4, 2.3]$

E. $x_1 \in [-0.88, -0.45]$ and $x_2 \in [-2.7, 1.3]$

---

23. Choose the equation of the function graphed below.



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

B. $f(x) = \dfrac{-1}{x-2} + 3$

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

D. $f(x) = \dfrac{1}{x+2} + 3$

E. None of the above

---

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

$$\frac{5x}{6x+4} + \frac{-2x^2}{18x^2+36x+16} = \frac{7}{3x+4}$$

A. $x \in [-1.9, -0.97]$

B. $x \in [1.9, 3.18]$

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

D. $x_1 \in [-0.99, -0.42]$ and $x_2 \in [-4, 1]$

E. $x_1 \in [-0.99, -0.42]$ and $x_2 \in [2, 11]$
