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

$$-\sqrt{\frac{1105}{13}}$$

   A. Whole

   B. Rational

   C. Integer

   D. Irrational

   E. Not a Real number

---

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

$$6 - 18 \div 11 * 9 - (16 * 13)$$

   A. $[-221, -216]$

   B. $[-205, -197]$

   C. $[211, 215]$

   D. $[60, 65]$

   E. $[-328, -320]$

---

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

$$\frac{8}{2} + 5i^2$$

   A. Pure Imaginary

   B. Irrational

   C. Rational

   D. Not a Complex Number

   E. Nonreal Complex

---

4. Factor the quadratic below. Then, choose the intervals that contain the constants in the form $(x+a)(x+b); a \leq b$.

$$x^2 + 4x - 192$$

   A. $a \in [-0.62, 0.88]$ and $b \in [3, 8]$
   B. $a \in [1.91, 3.59]$ and $b \in [-1, 3]$
   C. $a \in [-48.31, -47.22]$ and $b \in [3, 8]$
   D. $a \in [-12.56, -11.75]$ and $b \in [10, 20]$
   E. $a \in [-96.49, -95.92]$ and $b \in [-1, 3]$

---

5. Factor the quadratic below. Then, choose the intervals that contain the constants in the form $(ax+b)(cx+d); b \leq d$.

$$9x^2 - 9$$

   A. $a \in [2, 5], b \in [-6, 0], c \in [2.19, 4.35],$ and $d \in [0, 7]$
   B. $a \in [2, 5], b \in [-6, 0], c \in [2.19, 4.35],$ and $d \in [-7, 1]$
   C. $a \in [2, 5], b \in [2, 11], c \in [2.19, 4.35],$ and $d \in [0, 7]$
   D. $a \in [-2, 2], b \in [2, 11], c \in [0.43, 1.88],$ and $d \in [0, 7]$
   E. $a \in [-2, 2], b \in [2, 11], c \in [0.43, 1.88],$ and $d \in [-7, 1]$

---

6. Factor the quadratic below. Then, choose the intervals that contain the constants in the form $(ax+b)(cx+d); b \leq d$.

$$15x^2 + 62x + 40$$

   A. $a \in [-4.1, -2.6], b \in [-15, -3], c \in [-7, -3],$ and $d \in [-8, -2]$
   B. $a \in [0.7, 1.6], b \in [-3, 7], c \in [13, 17],$ and $d \in [8, 13]$
   C. $a \in [4.3, 7.8], b \in [-3, 7], c \in [-3, 6],$ and $d \in [8, 13]$
   D. $a \in [0.7, 1.6], b \in [9, 13], c \in [13, 17],$ and $d \in [-1, 9]$
   E. $a \in [-4.1, -2.6], b \in [9, 13], c \in [-7, -3],$ and $d \in [-1, 9]$

---

7. 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.

$$(4, 5) \text{ and } (-2, 8)$$

A. $m \in [-0.6, 0.4]$ and $b \in [6.79, 7.22]$

B. $m \in [0.4, 1]$ and $b \in [8.27, 9.37]$

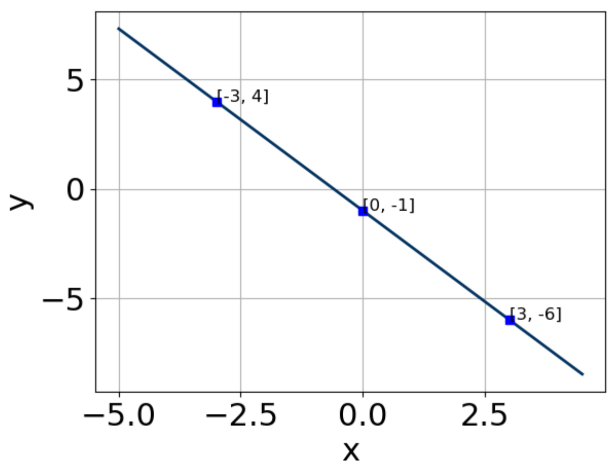
C. $m \in [-2, 1]$ and $b \in [-7.62, -6.55]$

D. $m \in [-7, 0]$ and $b \in [9.44, 10.73]$

E. $m \in [-1, 2]$ and $b \in [0.1, 1.07]$

---

8. Write the equation of the line in the graph below in the form $Ax + By = C$. Then, choose the intervals that contain $A, B,$ and C.



A. $A \in [3.33, 5.1], B \in [1.94, 3.81],$ and $C \in [-4.78, -2.55]$

B. $A \in [2.82, 3.13], B \in [-5.31, -4.33],$ and $C \in [3.66, 5.54]$

C. $A \in [-0.06, 1.54], B \in [-1.39, 0.04],$ and $C \in [3.66, 5.54]$

D. $A \in [0.86, 1.86], B \in [0.55, 2.37],$ and $C \in [-1.39, -0.84]$

E. $A \in [-6.2, -3.6], B \in [-3.36, -2.7],$ and $C \in [1.63, 3.71]$

---

9. Solve the linear equation below. Then, choose the intervals that contains the solution.

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

A. $x \in [-1.9, -0.7]$

B. $x \in [-5.1, -2.1]$

C. $x \in [-11.6, -8.8]$

D. $x \in [-3, -1.9]$

E. There are no Real solutions.

---

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

$$-10x - 9 \leq 8x - 10$$

A. $(-\infty, a]$, where $a \in [-0.031, 0.167]$

B. $[a, \infty)$, where $a \in [-0.189, -0.02]$

C. $[a, \infty)$, where $a \in [-0.002, 0.247]$

D. $(-\infty, a]$, where $a \in [-0.31, 0.037]$

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

---

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

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

A. $(-\infty, a)$, where $a \in [-5, 0]$

B. $(-\infty, a)$, where $a \in [-2, 7]$

C. (a, ∞), where $a \in [1, 4]$

D. (a, ∞), where $a \in [-3, 0]$

E. There is no solution to the inequality.

---

12. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set. *Hint: Try breaking up the compound inequality into two separate inequalities to solve, then put them back together at the end.*

$$7 + 7x < \frac{50x - 4}{6} \leq 8 + 8x$$

A. $(a, b]$, where $a \in [-29, -25]$ and $b \in [-10, -5]$

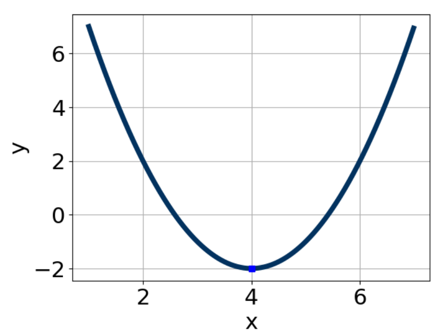
B. $[a, b)$, where $a \in [-29, -24]$ and $b \in [-10, 2]$

C. $(a, b]$, where $a \in [2, 8]$ and $b \in [23, 31]$

D. $[a, b)$, where $a \in [4, 7]$ and $b \in [25, 29]$

E. There is no solution to the inequality.

13. 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. $a \in [0.5, 1.2], b \in [-9, -6]$, and $c \in [17, 20]$

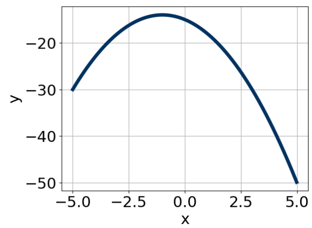
B. $a \in [-1.4, 0.1], b \in [5, 13]$, and $c \in [11, 15]$

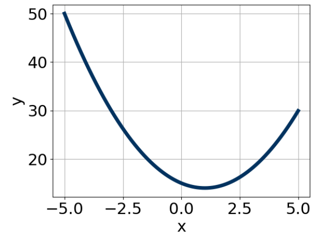
C. $a \in [0, 2], b \in [5, 13]$, and $c \in [11, 15]$

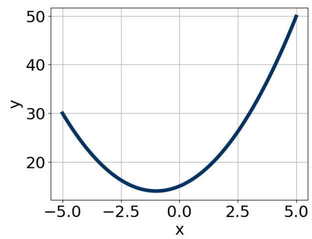
D. $a \in [0.5, 1.2], b \in [-9, -6]$, and $c \in [11, 15]$

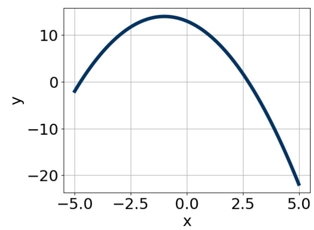
E. $a \in [0.5, 1.2], b \in [5, 13]$, and $c \in [17, 20]$

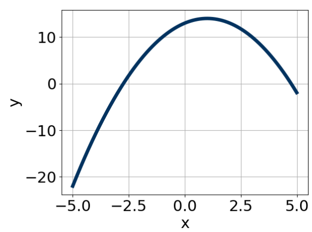
14. Graph the equation $f(x) = -(x-1)^2 + 14$.

A. 

D. 

B. 

E. 

C. 

15. Solve the quadratic equation below. Then, choose the intervals that the solutions x_1 and x_2 belong to, with $x_1 \leq x_2$.

$$36x^2 - 2x - 10 = 0$$

A. $x_1 \in [-2.194, -1.828]$ and $x_2 \in [0.068, 0.19]$

B. $x_1 \in [-0.239, -0.059]$ and $x_2 \in [1.585, 1.69]$

C. $x_1 \in [-0.107, -0.045]$ and $x_2 \in [4.988, 5.023]$

D. $x_1 \in [-1.191, -0.862]$ and $x_2 \in [0.189, 0.29]$

E. $x_1 \in [-0.597, -0.457]$ and $x_2 \in [0.506, 0.581]$

16. What is the domain of the function below?

$$f(x) = \sqrt[8]{-5x+6}$$

A. $(-\infty, a]$, where $a \in [0.815, 0.959]$

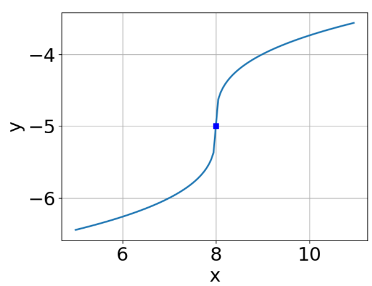
B. $[a, \infty)$, where $a \in [1.118, 1.468]$

C. $[a, \infty)$, where $a \in [0.808, 0.928]$

D. $(-\infty, a]$, where $a \in [1.059, 1.666]$

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

17. Choose the equation of the function graphed below.



A. $f(x) = \sqrt[3]{x+8} - 5$

B. $f(x) = -\sqrt[3]{x+8} - 5$

C. $f(x) = -\sqrt[3]{x-8} - 5$

D. $f(x) = \sqrt[3]{x-8} - 5$

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

$$\sqrt{4x+9} - \sqrt{7x+9} = 0$$

A. $x \in [-2, 4]$

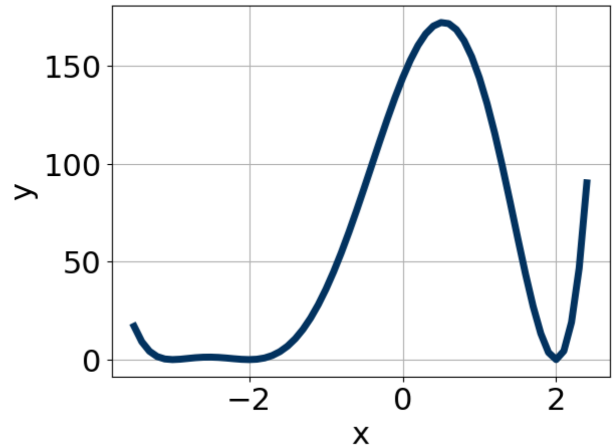
B. $x_1 \in [-2, 4]$ and $x_2 \in [-5, -2]$

C. $x_1 \in [-2, 4]$ and $x_2 \in [-2, 5]$

D. $x \in [-2, 4]$

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

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



A. $(x-2)^2(x+2)^2(x+3)^2$

B. $(x-2)^2(x+2)(x+3)^2$

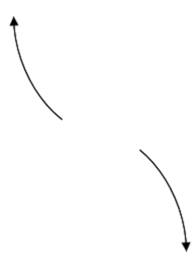
C. $(x-2)(x+2)(x+3)^2$

D. $-(x-2)^2(x+2)(x+3)^2$

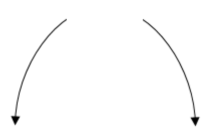
E. $-(x-2)^2(x+2)^2(x+3)^2$

20. Choose the end behavior of the polynomial below.

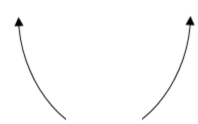
$$f(x) = -2(x-9)^4(x-8)^3(x+8)^4(x+9)^3$$



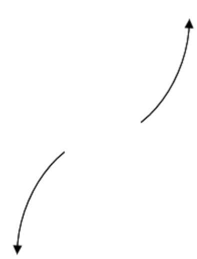
A.



B.



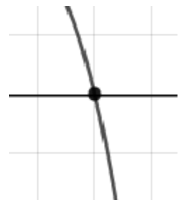
C.

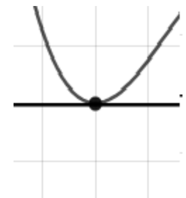


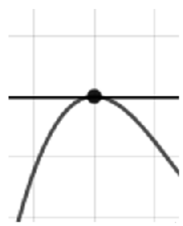
D.

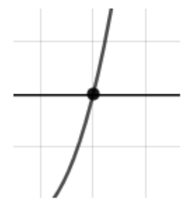
21. Describe the zero behavior of the zero 8 of the polynomial below.

$$f(x) = -2(x-9)^4(x-8)^3(x+8)^4(x+9)^3$$

A. 

C. 

B. 

D. 

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

$$f(x) = -\log_2(x+6) - 3$$

A. $(-\infty, a], a \in [-3.4, -1.3]$

B. $[a, \infty), a \in [2.8, 3.4]$

C. $(-\infty, a), a \in [5.7, 7.4]$

D. $(a, \infty), a \in [-8.7, -5.8]$

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

---

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

$$f(x) = e^{x-4} + 8$$

A. $[a, \infty), a \in [-11, -5]$

B. $(-\infty, a], a \in [3, 9]$

C. $(-\infty, a), a \in [3, 9]$

D. $(a, \infty), a \in [-11, -5]$

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

---

24. Use the properties of logarithmic functions to simplify the left side of the equation below. Then, convert to exponential form to solve for x and choose the interval that contains x (if it exists).

$$22 = \ln \sqrt{\frac{22}{e^x}}$$

A. $x \in [-45, -39]$

B. $x \in [40, 43]$

C. $x \in [14, 22]$

D. $x \in [-24, -12]$

E. There is no solution to the equation.

---

25. Have you bubbled in your name, section number, UFID, test code, and special code on your scantron? *Any issues bubbling in your scantron will delay your final exam results.* What is your test code form?

A. A

B. B

C. C

Yes, this counts as a question.
