1. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 13$ and choose the interval the $f^{-1}(13)$ belongs to.

$$f(x) = \sqrt[3]{5x - 4}$$

A. $f^{-1}(13) \in [-439.6, -437.3]$

B. $f^{-1}(13) \in [440, 441]$

C. $f^{-1}(13) \in [-442.7, -439]$

D. $f^{-1}(13) \in [435.5, 439]$

E. The function is not invertible for all Real numbers.

---

2. Subtract the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \frac{2}{5x + 34} \text{ and } g(x) = x^4 + 4x^3 + x^2 + 7x$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-6.5, 7.5]$

B. The domain is all Real numbers except $x = a$, where $a \in [-6.8, -2.8]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [2.2, 7.2]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [1.75, 4.75]$ and $b \in [-5.67, -1.67]$

E. The domain is all Real numbers.

---

3. Add the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \sqrt{-6x - 18} \text{ and } g(x) = 4x^2 + 2x + 4$$

A. The domain is all Real numbers except $x = a$, where $a \in [-7.67, -3.67]$

B. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-4, -1]$

C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-7.4, -2.4]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-6.2, -1.2]$ and $b \in [-8.17, -1.17]$

E. The domain is all Real numbers.

---

4. Choose the interval below that f composed with g at $x = 1$ is in.

$$f(x) = -3x^3 + 3x^2 + 4x \text{ and } g(x) = x^3 - 1x^2 - 2x$$

A. $(f \circ g)(1) \in [14, 20]$

B. $(f \circ g)(1) \in [28, 31]$

C. $(f \circ g)(1) \in [47, 52]$

D. $(f \circ g)(1) \in [37, 46]$

E. It is not possible to compose the two functions.

---

5. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = x^3 + 2x^2 + 4x \text{ and } g(x) = -3x^3 - 1x^2 + 2x$$

A. $(f \circ g)(-1) \in [56, 65]$

B. $(f \circ g)(-1) \in [0, 1]$

C. $(f \circ g)(-1) \in [6, 14]$

D. $(f \circ g)(-1) \in [64, 69]$

E. It is not possible to compose the two functions.

---

6. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = -11$ and choose the interval that $f^{-1}(-11)$ belongs to.

$$f(x) = 5x^2 - 3$$

A. $f^{-1}(-11) \in [0.99, 1.41]$

B. $f^{-1}(-11) \in [2.23, 2.55]$

C. $f^{-1}(-11) \in [1.51, 1.87]$

D. $f^{-1}(-11) \in [5.15, 5.38]$

E. The function is not invertible for all Real numbers.

---

7. Determine whether the function below is 1-1.

$$f(x) = 16x^2 + 32x - 425$$

A. No, because there is a y-value that goes to 2 different x-values.

B. No, because the domain of the function is not $(-\infty, \infty)$.

C. Yes, the function is 1-1.

D. No, because there is an x-value that goes to 2 different y-values.

E. No, because the range of the function is not $(-\infty, \infty)$.

---

8. Find the inverse of the function below. Then, evaluate the inverse at $x = 6$ and choose the interval that $f^{-1}(6)$ belongs to.

$$f(x) = \ln(x + 4) + 2$$

A. $f^{-1}(6) \in [53.6, 65.6]$

B. $f^{-1}(6) \in [22024.47, 22031.47]$

C. $f^{-1}(6) \in [7.39, 12.39]$

D. $f^{-1}(6) \in [49.6, 54.6]$

E. $f^{-1}(6) \in [2974.96, 2983.96]$

---

9. Determine whether the function below is 1-1.

$$f(x) = 25x^2 - 250x + 625$$

A. Yes, the function is 1-1.

B. No, because there is a y-value that goes to 2 different x-values.

C. No, because the range of the function is not $(-\infty, \infty)$.

D. No, because there is an x-value that goes to 2 different y-values.

E. No, because the domain of the function is not $(-\infty, \infty)$.

---

10. Find the inverse of the function below. Then, evaluate the inverse at $x = 7$ and choose the interval that $f^{-1}(7)$ belongs to.

$$f(x) = \ln(x - 2) - 2$$

A. $f^{-1}(7) \in [148.41, 155.41]$

B. $f^{-1}(7) \in [8099.08, 8103.08]$

C. $f^{-1}(7) \in [8102.08, 8107.08]$

D. $f^{-1}(7) \in [146.41, 148.41]$

E. $f^{-1}(7) \in [8099.08, 8103.08]$
