1. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 14$ and choose the interval the $f^{-1}(14)$ belongs to.

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

A. $f^{-1}(14) \in [-550.33, -549.18]$

B. $f^{-1}(14) \in [548, 548.78]$

C. $f^{-1}(14) \in [-548.46, -546.6]$

D. $f^{-1}(14) \in [548.34, 551.9]$

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

---

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

$$f(x) = 5x^3 + 8x^2 + 4x + 3 \text{ and } g(x) = \sqrt{4x + 17}$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-6.25, 4.75]$

B. The domain is all Real numbers except $x = a$, where $a \in [0.4, 6.4]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [4.8, 5.8]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [2.2, 5.2]$ and $b \in [-7.67, -2.67]$

E. The domain is all Real numbers.

---

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

$$f(x) = \sqrt{-4x - 12} \text{ and } g(x) = 9x + 5$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-7.5, -2.5]$

B. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-4, 6]$

C. The domain is all Real numbers except $x = a$, where $a \in [1.8, 5.8]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-4.67, -1.67]$ and $b \in [2.25, 10.25]$

E. The domain is all Real numbers.

---

4. Choose the interval below that f composed with g at $x = -2$ is in.

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

A. $(f \circ g)(-2) \in [31, 37]$

B. $(f \circ g)(-2) \in [-13, -10]$

C. $(f \circ g)(-2) \in [19, 29]$

D. $(f \circ g)(-2) \in [-24, -20]$

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

---

5. Choose the interval below that f composed with g at $x = 2$ is in.

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

A. $(f \circ g)(2) \in [-7, -1]$

B. $(f \circ g)(2) \in [66, 69]$

C. $(f \circ g)(2) \in [56, 59]$

D. $(f \circ g)(2) \in [-10, -6]$

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 $x = -12$ and choose the interval that $f^{-1}(-12)$ belongs to.

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

A. $f^{-1}(-12) \in [2.13, 2.95]$

B. $f^{-1}(-12) \in [1.24, 1.71]$

C. $f^{-1}(-12) \in [5.19, 6.21]$

D. $f^{-1}(-12) \in [3.3, 3.8]$

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

---

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

$$f(x) = -15x^2 + 212x - 672$$

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

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

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

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

E. Yes, the function is 1-1.

---

8. Find the inverse of the function below. Then, evaluate the inverse at $x = 9$ and choose the interval that $f^{-1}(9)$ belongs to.

$$f(x) = e^{x+4} + 3$$

A. $f^{-1}(9) \in [5.72, 5.84]$

B. $f^{-1}(9) \in [5.52, 5.71]$

C. $f^{-1}(9) \in [4.43, 4.65]$

D. $f^{-1}(9) \in [-2.43, -2.1]$

E. $f^{-1}(9) \in [5.36, 5.53]$

---

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

$$f(x) = \sqrt{5x - 21}$$

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

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

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

D. Yes, the function is 1-1.

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

---

10. Find the inverse of the function below. Then, evaluate the inverse at $x = 9$ and choose the interval that $f^{-1}(9)$ belongs to.

$$f(x) = e^{x-4} + 3$$

A. $f^{-1}(9) \in [5.33, 5.56]$

B. $f^{-1}(9) \in [5.6, 5.89]$

C. $f^{-1}(9) \in [4.59, 4.75]$

D. $f^{-1}(9) \in [-2.44, -2.16]$

E. $f^{-1}(9) \in [5.5, 5.62]$
