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

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

A. $(f \circ g)(-1) \in [7, 14]$

B. $(f \circ g)(-1) \in [0, 3]$

C. $(f \circ g)(-1) \in [69, 79]$

D. $(f \circ g)(-1) \in [76, 88]$

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

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

$$f(x) = 4x^2 + 2$$

A. $f^{-1}(10) \in [4.75, 5.55]$

B. $f^{-1}(10) \in [-0.04, 1.42]$

C. $f^{-1}(10) \in [2.38, 4.3]$

D. $f^{-1}(10) \in [1.59, 2.01]$

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

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

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

A. $f^{-1}(-10) \in [248.25, 250.25]$

B. $f^{-1}(-10) \in [250.75, 252.75]$

C. $f^{-1}(-10) \in [-249.25, -247.25]$

D. $f^{-1}(-10) \in [-252.75, -249.75]$

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

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

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

A. $(f \circ g)(1) \in [23, 26]$

B. $(f \circ g)(1) \in [28, 32]$

C. $(f \circ g)(1) \in [-54, -50]$

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

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

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

$$f(x) = \sqrt{6x - 20}$$

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

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

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

D. Yes, the function is 1-1.

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

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

$$f(x) = \ln(x - 3) + 2$$

A. $f^{-1}(8) \in [397.43, 401.43]$

B. $f^{-1}(8) \in [22027.47, 22031.47]$

C. $f^{-1}(8) \in [144.41, 151.41]$

D. $f^{-1}(8) \in [59876.14, 59877.14]$

E. $f^{-1}(8) \in [403.43, 408.43]$

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

$$f(x) = e^{x+4} - 2$$

A. $f^{-1}(6) \in [-2.99, -1.9]$

B. $f^{-1}(6) \in [5.92, 6.27]$

C. $f^{-1}(6) \in [0.1, 1.54]$

D. $f^{-1}(6) \in [-1.36, -0.9]$

E. $f^{-1}(6) \in [-0.78, -0.48]$

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

$$f(x) = \sqrt{4x - 17} \text{ and } g(x) = 9x + 7$$

A. The domain is all Real numbers except $x = a$, where $a \in [1.8, 6.8]$

B. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-1.5, 5.5]$

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

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-9.83, -1.83]$ and $b \in [1.2, 9.2]$

E. The domain is all Real numbers.

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

$$f(x) = \sqrt{-6x + 29}$$

A. Yes, the function is 1-1.

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

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

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

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

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

$$f(x) = 7x^3 + 9x^2 + 5x + 7 \text{ and } g(x) = 7x^4 + 9x^3 + 4x + 2$$

A. The domain is all Real numbers except $x = a,$ where $a \in [3.75, 8.75]$

B. The domain is all Real numbers less than or equal to $x = a,$ where $a \in [-4, 0]$

C. The domain is all Real numbers greater than or equal to $x = a,$ where $a \in [-6.67, -1.67]$

D. The domain is all Real numbers except $x = a$ and $x = b,$ where $a \in [2.33, 7.33]$ and $b \in [-0.4, 8.6]$

E. The domain is all Real numbers.
