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

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

A. $f^{-1}(8) \in [4.33, 4.59]$

B. $f^{-1}(8) \in [4.17, 4.34]$

C. $f^{-1}(8) \in [5.36, 6]$

D. $f^{-1}(8) \in [-2.43, -2.18]$

E. $f^{-1}(8) \in [3.28, 3.69]$

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

$$f(x) = 6x^2 + 6x + 5 \text{ and } g(x) = 5x + 1$$

A. The domain is all Real numbers less than or equal to $x = a$, where $a \in [0.2, 9.2]$

B. The domain is all Real numbers except $x = a$, where $a \in [1.75, 7.75]$

C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [3.33, 9.33]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [2.2, 9.2]$ and $b \in [4.25, 6.25]$

E. The domain is all Real numbers.

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

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

A. $(f \circ g)(-1) \in [-71, -67]$

B. $(f \circ g)(-1) \in [100, 107]$

C. $(f \circ g)(-1) \in [-82, -78]$

D. $(f \circ g)(-1) \in [91, 95]$

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

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4. 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.

$$f(x) = 3x^2 - 4$$

A. $f^{-1}(10) \in [1.92, 3.29]$

B. $f^{-1}(10) \in [4.08, 5.39]$

C. $f^{-1}(10) \in [0.22, 2.01]$

D. $f^{-1}(10) \in [5.04, 6.9]$

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

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

$$f(x) = \frac{4}{6x + 19} \text{ and } g(x) = \frac{4}{5x - 26}$$

A. The domain is all Real numbers less than or equal to $x = a$, where $a \in [1.17, 5.17]$

B. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [5.25, 10.25]$

C. The domain is all Real numbers except $x = a$, where $a \in [-7.6, -0.6]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-5.17, 2.83]$ and $b \in [1.2, 12.2]$

E. The domain is all Real numbers.

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

$$f(x) = \sqrt{-3x - 8}$$

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 the range of the function is not $(-\infty, \infty)$.

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

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

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

A. $(f \circ g)(-1) \in [34, 44]$

B. $(f \circ g)(-1) \in [3, 5]$

C. $(f \circ g)(-1) \in [-6, -3]$

D. $(f \circ g)(-1) \in [42, 50]$

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

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8. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = -15$ and choose the interval that $f^{-1}(-15)$ belongs to.

$$f(x) = 4x^2 - 5$$

A. $f^{-1}(-15) \in [0.4, 2.05]$

B. $f^{-1}(-15) \in [3.75, 4.87]$

C. $f^{-1}(-15) \in [2.15, 2.66]$

D. $f^{-1}(-15) \in [6.34, 7.06]$

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

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

$$f(x) = \sqrt{3x + 13}$$

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

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 the domain of the function is not $(-\infty, \infty)$.

E. Yes, the function is 1-1.

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

$$f(x) = e^{x+4} - 5$$

A. $f^{-1}(10) \in [-2.43, -2.36]$

B. $f^{-1}(10) \in [-3.33, -3.13]$

C. $f^{-1}(10) \in [-3.54, -3.21]$

D. $f^{-1}(10) \in [6.68, 6.81]$

E. $f^{-1}(10) \in [-1.34, -1.16]$
