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

$$f(x) = (6x + 33)^3$$

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

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

   E. Yes, the function is 1-1.

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

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

   A. $(f \circ g)(-1) \in [-3.2, 1.6]$

   B. $(f \circ g)(-1) \in [1.9, 2.6]$

   C. $(f \circ g)(-1) \in [2.4, 6]$

   D. $(f \circ g)(-1) \in [6.2, 9]$

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

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

$$f(x) = 4x + 5 \text{ and } g(x) = \sqrt{6x + 32}$$

   A. The domain is all Real numbers except $x = a$, where $a \in [-8.67, -0.67]$

   B. The domain is all Real numbers less than or equal to $x = a$, where $a \in [4.75, 7.75]$

   C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-8.33, -3.33]$

   D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-0.83, 7.17]$ and $b \in [1.67, 12.67]$

E. The domain is all Real numbers.

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

$$f(x) = e^{x-3} + 5$$

A. $f^{-1}(7) \in [-2.42, -2.13]$

B. $f^{-1}(7) \in [7.47, 7.57]$

C. $f^{-1}(7) \in [7.08, 7.35]$

D. $f^{-1}(7) \in [3.44, 4]$

E. $f^{-1}(7) \in [6.34, 6.52]$

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5. 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.

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

A. $f^{-1}(15) \in [1.15, 1.57]$

B. $f^{-1}(15) \in [2.41, 3.18]$

C. $f^{-1}(15) \in [3.77, 4.14]$

D. $f^{-1}(15) \in [1.86, 2.05]$

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

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

$$f(x) = \sqrt{5x - 31} \text{ and } g(x) = 9x + 2$$

A. The domain is all Real numbers less than or equal to $x = a$, where $a \in [1.33, 6.33]$

B. The domain is all Real numbers except $x = a$, where $a \in [2.25, 5.25]$

C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [4.2, 10.2]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [2.33, 4.33]$ and $b \in [-9.33, -5.33]$

E. The domain is all Real numbers.

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

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

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

B. $(f \circ g)(1) \in [0, 9]$

C. $(f \circ g)(1) \in [-12, -6]$

D. $(f \circ g)(1) \in [-8, -3]$

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.

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

A. $f^{-1}(-15) \in [7.06, 7.48]$

B. $f^{-1}(-15) \in [4.07, 5.74]$

C. $f^{-1}(-15) \in [1.92, 2.72]$

D. $f^{-1}(-15) \in [2.94, 3.02]$

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

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

$$f(x) = e^{x-2} - 3$$

A. $f^{-1}(6) \in [-1.64, -1.28]$

B. $f^{-1}(6) \in [0.14, 0.28]$

C. $f^{-1}(6) \in [-2.08, -1.81]$

D. $f^{-1}(6) \in [-1.37, -0.78]$

E. $f^{-1}(6) \in [3.76, 4.25]$

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

$$f(x) = \sqrt{3x + 20}$$

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.
