1. 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. $f^{-1}(12) \in [1.03, 1.59]$
   B. $f^{-1}(12) \in [6.21, 6.82]$
   C. $f^{-1}(12) \in [4.65, 6.05]$
   D. $f^{-1}(12) \in [2.31, 2.5]$
   E. The function is not invertible for all Real numbers.

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

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

   A. No, because the domain of the function is not $(-\infty, \infty)$.
   B. No, because there is a y-value that goes to 2 different x-values.
   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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3. Choose the interval below that f composed with g at $x = 1$ is in.

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

   A. $(f \circ g)(1) \in [5, 11]$
   B. $(f \circ g)(1) \in [15, 20]$
   C. $(f \circ g)(1) \in [-4, 2]$
   D. $(f \circ g)(1) \in [-7, -3]$
   E. It is not possible to compose the two functions.

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

$$f(x) = \frac{5}{3x+20} \text{ and } g(x) = \frac{3}{3x+20}$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-8, -5]$

B. The domain is all Real numbers except $x = a$, where $a \in [-4.2, -1.2]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-6, 0]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-7.67, -3.67]$ and $b \in [-8.67, -0.67]$

E. The domain is all Real numbers.

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

$$f(x) = \ln(x+5) - 4$$

A. $f^{-1}(10) \in [392.43, 400.43]$

B. $f^{-1}(10) \in [140.41, 148.41]$

C. $f^{-1}(10) \in [1202609.28, 1202610.28]$

D. $f^{-1}(10) \in [1202599.28, 1202603.28]$

E. $f^{-1}(10) \in [3269011.37, 3269020.37]$

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

$$f(x) = \frac{4}{5x+33} \text{ and } g(x) = \frac{3}{5x+28}$$

A. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-5.67, -3.67]$

B. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [1.67, 7.67]$

C. The domain is all Real numbers except $x = a$, where $a \in [-5.25, 0.75]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-7.6, 1.4]$ and $b \in [-5.6, -1.6]$

E. The domain is all Real numbers.

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

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

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

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

C. Yes, the function is 1-1.

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

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

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8. 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.

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

A. $f^{-1}(12) \in [1.27, 2.18]$

B. $f^{-1}(12) \in [4.75, 6.2]$

C. $f^{-1}(12) \in [3.01, 3.47]$

D. $f^{-1}(12) \in [1.97, 2.74]$

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 $x = 10$ and choose the interval that $f^{-1}(10)$ belongs to.

$$f(x) = e^{x+2} - 5$$

A. $f^{-1}(10) \in [-3.78, -3.1]$

B. $f^{-1}(10) \in [0.67, 0.82]$

C. $f^{-1}(10) \in [4.55, 5.02]$

D. $f^{-1}(10) \in [-3.07, -2.86]$

E. $f^{-1}(10) \in [-2.54, -2.23]$

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

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

A. $(f \circ g)(1) \in [-2.75, -1.81]$

B. $(f \circ g)(1) \in [6.96, 7.32]$

C. $(f \circ g)(1) \in [-8.81, -7.52]$

D. $(f \circ g)(1) \in [-1.87, 0.65]$

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