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.

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

   A. $f^{-1}(12) \in [5.84, 6.11]$
   B. $f^{-1}(12) \in [3.55, 4.56]$
   C. $f^{-1}(12) \in [0.95, 1.74]$
   D. $f^{-1}(12) \in [1.66, 2.33]$
   E. The function is not invertible for all Real numbers.

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

$$f(x) = (4x - 19)^3$$

   A. No, because there is an x-value that goes to 2 different y-values.
   B. No, because the range of the function is not $(-\infty, \infty)$.
   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 domain of the function is not $(-\infty, \infty)$.

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

$$f(x) = 25x^2 - 140x + 196$$

   A. No, because there is a y-value that goes to 2 different x-values.
   B. Yes, the function is 1-1.
   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. No, because the range of the function is not $(-\infty, \infty)$.

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

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

A. $f^{-1}(8) \in [-3.12, -2.79]$

B. $f^{-1}(8) \in [5.55, 6.77]$

C. $f^{-1}(8) \in [7.54, 8.2]$

D. $f^{-1}(8) \in [7.33, 7.56]$

E. $f^{-1}(8) \in [4.91, 5.36]$

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

$$f(x) = \frac{2}{5x - 28} \text{ and } g(x) = 7x + 2$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-11.33, -5.33]$

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 $a \in [4.6, 8.6]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-5.25, -2.25]$ and $b \in [-6.2, -4.2]$

E. The domain is all Real numbers.

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6. 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.

$$f(x) = \sqrt[3]{4x + 5}$$

A. $f^{-1}(14) \in [683.2, 686]$

B. $f^{-1}(14) \in [-687.4, -687.2]$

C. $f^{-1}(14) \in [686.5, 689.8]$

D. $f^{-1}(14) \in [-685.1, -684]$

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

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

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

A. $(f \circ g)(1) \in [8.7, 9.1]$

B. $(f \circ g)(1) \in [0.8, 3.5]$

C. $(f \circ g)(1) \in [9.3, 12.7]$

D. $(f \circ g)(1) \in [-1.7, 1.2]$

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

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

$$f(x) = \frac{3}{3x - 17} \text{ and } g(x) = \frac{5}{4x + 21}$$

A. The domain is all Real numbers less than or equal to $x = a$, where $a \in [0, 8]$

B. The domain is all Real numbers except $x = a$, where $a \in [2.67, 6.67]$

C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-10.6, 0.4]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [3.67, 12.67]$ and $b \in [-9.25, -4.25]$

E. The domain is all Real numbers.

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

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

A. $(f \circ g)(-1) \in [-33, -27]$

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

C. $(f \circ g)(-1) \in [-27, -21]$

D. $(f \circ g)(-1) \in [-10, -1]$

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

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

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

A. $f^{-1}(8) \in [3.55, 3.72]$

B. $f^{-1}(8) \in [-1.23, -1.09]$

C. $f^{-1}(8) \in [4.21, 4.33]$

D. $f^{-1}(8) \in [4.37, 4.44]$

E. $f^{-1}(8) \in [4.76, 4.8]$
