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

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

A. $f^{-1}(10) \in [-2.06, -1.26]$

B. $f^{-1}(10) \in [-0.43, 0.04]$

C. $f^{-1}(10) \in [-2.62, -2.38]$

D. $f^{-1}(10) \in [-1.11, -0.53]$

E. $f^{-1}(10) \in [7.54, 8.2]$

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

$$f(x) = 5x^4 + 4x^3 + 4x^2 + 3x + 2 \text{ and } g(x) = \frac{4}{5x - 33}$$

A. The domain is all Real numbers except $x = a$, where $a \in [4.6, 10.6]$

B. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [4.5, 5.5]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-6, -4]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [5.25, 6.25]$ and $b \in [4.6, 9.6]$

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.

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

A. $(f \circ g)(1) \in [9, 13]$

B. $(f \circ g)(1) \in [-55, -49]$

C. $(f \circ g)(1) \in [-43, -40]$

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

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

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

$$f(x) = \frac{1}{4x - 25} \text{ and } g(x) = \frac{5}{5x + 26}$$

A. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-4.33, 1.67]$

B. The domain is all Real numbers except $x = a$, where $a \in [-7.6, 0.4]$

C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-15, -5]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [5.25, 10.25]$ and $b \in [-5.2, -2.2]$

E. The domain is all Real numbers.

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

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

A. $(f \circ g)(1) \in [-8.6, -4.2]$

B. $(f \circ g)(1) \in [-4.6, -3.6]$

C. $(f \circ g)(1) \in [-3.7, 0.7]$

D. $(f \circ g)(1) \in [-15.4, -12.3]$

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

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6. 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.

$$f(x) = 5x^2 + 2$$

A. $f^{-1}(-15) \in [4.73, 5.5]$

B. $f^{-1}(-15) \in [2.5, 3.56]$

C. $f^{-1}(-15) \in [1.7, 2.39]$

D. $f^{-1}(-15) \in [1.43, 1.8]$

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

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

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

A. $f^{-1}(8) \in [2.94, 3.21]$

B. $f^{-1}(8) \in [7.13, 7.36]$

C. $f^{-1}(8) \in [6.4, 6.84]$

D. $f^{-1}(8) \in [7.52, 7.9]$

E. $f^{-1}(8) \in [-1.07, -0.64]$

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8. 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.

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

A. $f^{-1}(10) \in [0.41, 1.38]$

B. $f^{-1}(10) \in [6.96, 7.59]$

C. $f^{-1}(10) \in [1.26, 2.04]$

D. $f^{-1}(10) \in [3.23, 4.28]$

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

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

$$f(x) = 16x^2 + 176x + 484$$

A. Yes, the function is 1-1.

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

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

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

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

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

$$f(x) = (3x - 20)^3$$

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. 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 $(-\infty, \infty)$.
