

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

$$f(x) = \sqrt{5x - 33} \text{ and } g(x) = 8x^3 + 4x^2 + 9x + 8$$

- A. The domain is all Real numbers greater than or equal to  $x = a$ , where  $a \in [-3, 9]$
  - B. The domain is all Real numbers except  $x = a$ , where  $a \in [-7, 2]$
  - C. The domain is all Real numbers less than or equal to  $x = a$ , where  $a \in [0, 11]$
  - D. The domain is all Real numbers except  $x = a$  and  $x = b$ , where  $a \in [2, 9]$  and  $b \in [-3, 6]$
  - E. The domain is all Real numbers.
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2. Find the inverse of the function below. Then, evaluate the inverse at  $x = 9$  and choose the interval that  $f^{-1}(9)$  belongs to.

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

- A.  $f^{-1}(9) \in [3.53, 3.72]$
  - B.  $f^{-1}(9) \in [6.43, 6.63]$
  - C.  $f^{-1}(9) \in [-0.44, -0.35]$
  - D.  $f^{-1}(9) \in [5.9, 6.01]$
  - E.  $f^{-1}(9) \in [6.33, 6.53]$
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3. Find the inverse of the function below (if it exists). Then, evaluate the inverse at  $x = 12$  and choose the interval the  $f^{-1}(12)$  belongs to.

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

- A.  $f^{-1}(12) \in [-345.76, -344.27]$

- B.  $f^{-1}(12) \in [346.12, 346.26]$
  - C.  $f^{-1}(12) \in [-347.17, -345.73]$
  - D.  $f^{-1}(12) \in [344.5, 345.61]$
  - E. The function is not invertible for all Real numbers.
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4. Determine whether the function below is 1-1.

$$f(x) = (3x - 15)^3$$

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

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

- A.  $(f \circ g)(-1) \in [45, 52]$
  - B.  $(f \circ g)(-1) \in [53, 59]$
  - C.  $(f \circ g)(-1) \in [-5, -2]$
  - D.  $(f \circ g)(-1) \in [-2, 5]$
  - E. It is not possible to compose the two functions.
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