

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.

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

- A.  $f^{-1}(12) \in [3.29, 4.04]$
  - B.  $f^{-1}(12) \in [1.45, 1.52]$
  - C.  $f^{-1}(12) \in [2.03, 3.45]$
  - D.  $f^{-1}(12) \in [1.76, 2.33]$
  - E. The function is not invertible for all Real numbers.
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2. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \frac{2}{4x + 29} \text{ and } g(x) = \frac{1}{3x + 10}$$

- A. The domain is all Real numbers greater than or equal to  $x = a$ , where  $a \in [-5, -2]$
  - B. The domain is all Real numbers except  $x = a$ , where  $a \in [-3.25, -2.25]$
  - C. The domain is all Real numbers less than or equal to  $x = a$ , where  $a \in [3, 5]$
  - D. The domain is all Real numbers except  $x = a$  and  $x = b$ , where  $a \in [-7.25, -3.25]$  and  $b \in [-7.33, -1.33]$
  - E. The domain is all Real numbers.
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3. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 5x^3 + 7x^2 + 1 \text{ and } g(x) = 8x + 7$$

- A. The domain is all Real numbers less than or equal to  $x = a$ , where  $a \in [-4.67, -1.67]$

- B. The domain is all Real numbers greater than or equal to  $x = a$ , where  $a \in [1, 5]$
- C. The domain is all Real numbers except  $x = a$ , where  $a \in [1.4, 5.4]$
- D. The domain is all Real numbers except  $x = a$  and  $x = b$ , where  $a \in [5.2, 8.2]$  and  $b \in [-7.2, -3.2]$
- E. The domain is all Real numbers.

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

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

- A.  $(f \circ g)(1) \in [12, 18]$
- B.  $(f \circ g)(1) \in [-2, 4]$
- C.  $(f \circ g)(1) \in [7, 11]$
- D.  $(f \circ g)(1) \in [7, 11]$
- E. It is not possible to compose the two functions.

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

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

- A.  $(f \circ g)(-2) \in [95, 104]$
- B.  $(f \circ g)(-2) \in [-8, -1]$
- C.  $(f \circ g)(-2) \in [85, 91]$
- D.  $(f \circ g)(-2) \in [4, 12]$
- E. It is not possible to compose the two functions.

6. Find the inverse of the function below (if it exists). Then, evaluate the inverse at  $x = 11$  and choose the interval that  $f^{-1}(11)$  belongs to.

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

- A.  $f^{-1}(11) \in [4.54, 5.73]$
  - B.  $f^{-1}(11) \in [2.68, 4.39]$
  - C.  $f^{-1}(11) \in [0.87, 1.6]$
  - D.  $f^{-1}(11) \in [1.39, 1.65]$
  - E. The function is not invertible for all Real numbers.
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7. Determine whether the function below is 1-1.

$$f(x) = 16x^2 + 112x + 196$$

- 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. Yes, the function is 1-1.
  - E. No, because the domain of the function is not  $(-\infty, \infty)$ .
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8. Find the inverse of the function below. Then, evaluate the inverse at  $x = 8$  and choose the interval that  $f^{-1}(8)$  belongs to.

$$f(x) = e^{x+4} + 3$$

- A.  $f^{-1}(8) \in [5.38, 5.44]$
  - B.  $f^{-1}(8) \in [-2.4, -2.36]$
  - C.  $f^{-1}(8) \in [5.48, 5.53]$
  - D.  $f^{-1}(8) \in [5.6, 5.63]$
  - E.  $f^{-1}(8) \in [4.25, 4.39]$
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9. Determine whether the function below is 1-1.

$$f(x) = (4x + 14)^3$$

- 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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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.

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

- A.  $f^{-1}(8) \in [6.77, 6.95]$
  - B.  $f^{-1}(8) \in [4.14, 4.45]$
  - C.  $f^{-1}(8) \in [2.84, 3.45]$
  - D.  $f^{-1}(8) \in [4.34, 4.67]$
  - E.  $f^{-1}(8) \in [-3.23, -3.06]$
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