

1. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{9x^3 + 12x^2 - 17x - 20}{3x^2 + 8x - 16}$$

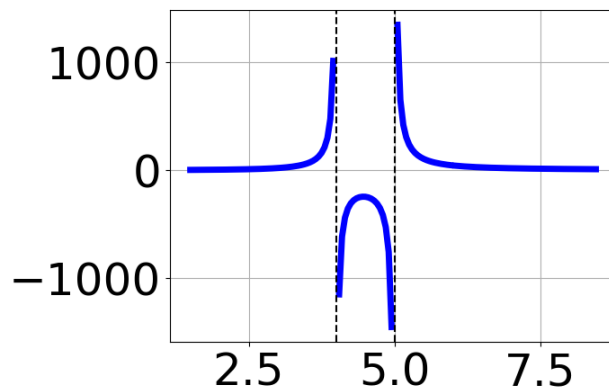
- A. Oblique Asymptote of $y = 3x - 4$.
 - B. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 3x - 4$
 - C. Horizontal Asymptote of $y = 3.0$
 - D. Horizontal Asymptote at $y = -4.0$
 - E. Horizontal Asymptote of $y = -4.0$ and Oblique Asymptote of $y = 3x - 4$
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2. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{16x^3 + 16x^2 - 25x - 25}{12x^2 - 7x - 10}$$

- A. Vertical Asymptote of $x = 1.333$ and hole at $x = 1.25$
 - B. Vertical Asymptote of $x = -0.667$ and hole at $x = 1.25$
 - C. Vertical Asymptotes of $x = -0.667$ and $x = -1.25$ with a hole at $x = 1.25$
 - D. Vertical Asymptotes of $x = -0.667$ and $x = 1.25$ with no holes.
 - E. Holes at $x = -0.667$ and $x = 1.25$ with no vertical asymptotes.
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3. Which of the following functions *could* be the graph below?



- A. $f(x) = \frac{x^3 + 8x^2 + 17x + 10}{x^3 - 15x^2 + 74x - 120}$
- B. $f(x) = \frac{x^3 - 1x^2 - 32x + 60}{x^3 + 15x^2 + 74x + 120}$
- C. $f(x) = \frac{x^3 - 1x^2 - 32x + 60}{x^3 + 15x^2 + 74x + 120}$
- D. $f(x) = \frac{x^3 + x^2 - 32x - 60}{x^3 - 15x^2 + 74x - 120}$
- E. None of the above are possible equations for the graph.

4. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{12x^3 + 53x^2 - 5x - 100}{3x^2 - x - 10}$$

- A. Horizontal Asymptote of $y = 4.0$ and Oblique Asymptote of $y = 4x + 19$
- B. Horizontal Asymptote at $y = 2.0$
- C. Horizontal Asymptote of $y = 4.0$
- D. Oblique Asymptote of $y = 4x + 19$.
- E. Horizontal Asymptote of $y = 2.0$ and Oblique Asymptote of $y = 4x + 19$

5. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 - 19x^2 - 45x - 18}{12x^2 + x - 6}$$

- A. Vertical Asymptotes of $x = 0.667$ and $x = -0.667$ with a hole at $x = -0.75$
 - B. Vertical Asymptote of $x = 1.0$ and hole at $x = -0.75$
 - C. Holes at $x = 0.667$ and $x = -0.75$ with no vertical asymptotes.
 - D. Vertical Asymptotes of $x = 0.667$ and $x = -0.75$ with no holes.
 - E. Vertical Asymptote of $x = 0.667$ and hole at $x = -0.75$
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6. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{12x^3 + 55x^2 + 18x - 40}{6x^3 + 4x^2 + 24x - 32}$$

- A. Horizontal Asymptote of $y = 2.000$
 - B. Vertical Asymptote of $y = -4$
 - C. Horizontal Asymptote of $y = 0$
 - D. None of the above
 - E. Vertical Asymptote of $y = -2.000$
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7. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{4x^3 - 32x^2 + 79x - 60}{6x^2 - 17x + 12}$$

- A. Vertical Asymptotes of $x = 1.333$ and $x = 2.5$ with a hole at $x = 1.5$
- B. Vertical Asymptote of $x = 1.333$ and hole at $x = 1.5$
- C. Holes at $x = 1.333$ and $x = 1.5$ with no vertical asymptotes.

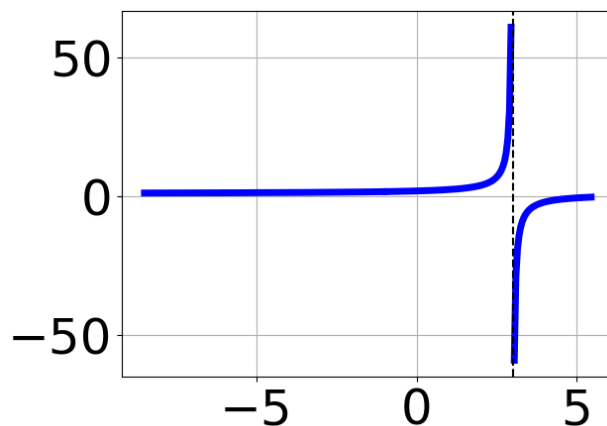
- D. Vertical Asymptote of $x = 0.667$ and hole at $x = 1.5$
- E. Vertical Asymptotes of $x = 1.333$ and $x = 1.5$ with no holes.

8. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 + 13x^2 - 37x - 30}{6x^2 - 19x + 15}$$

- A. Vertical Asymptotes of $x = 1.5$ and $x = 1.667$ with no holes.
- B. Holes at $x = 1.5$ and $x = 1.667$ with no vertical asymptotes.
- C. Vertical Asymptotes of $x = 1.5$ and $x = -0.75$ with a hole at $x = 1.667$
- D. Vertical Asymptote of $x = 2.0$ and hole at $x = 1.667$
- E. Vertical Asymptote of $x = 1.5$ and hole at $x = 1.667$

9. Which of the following functions *could* be the graph below?



- A. $f(x) = \frac{x^3 - 1x^2 - 36x + 36}{x^3 - 4x^2 - 15x + 18}$
- B. $f(x) = \frac{x^3 - 1x^2 - 36x + 36}{x^3 - 4x^2 - 15x + 18}$
- C. $f(x) = \frac{x^3 - 8x^2 + 4x + 48}{x^3 + 4x^2 - 15x - 18}$

D. $f(x) = \frac{x^3 + x^2 - 36x - 36}{x^3 + 4x^2 - 15x - 18}$

E. None of the above are possible equations for the graph.

10. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{12x^3 - 47x^2 + 56x - 20}{4x^3 + 2x^2 - 29x + 30}$$

- A. Vertical Asymptote of $y = -3.000$
- B. Vertical Asymptote of $y = 2$
- C. None of the above
- D. Horizontal Asymptote of $y = 3.000$
- E. Horizontal Asymptote of $y = 0$