

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

$$f(x) = \frac{12x^3 + 23x^2 - 8x - 12}{9x^2 - 9x - 10}$$

- A. Holes at $x = 1.667$ and $x = -0.667$ with no vertical asymptotes.
 - B. Vertical Asymptotes of $x = 1.667$ and $x = 0.75$ with a hole at $x = -0.667$
 - C. Vertical Asymptote of $x = 1.667$ and hole at $x = -0.667$
 - D. Vertical Asymptote of $x = 1.333$ and hole at $x = -0.667$
 - E. Vertical Asymptotes of $x = 1.667$ and $x = -0.667$ with no holes.
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2. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{2x^2 - x - 6}{10x^3 + 33x^2 + 35x + 12}$$

- A. Horizontal Asymptote at $y = 2.000$
 - B. Horizontal Asymptote of $y = 0$
 - C. Horizontal Asymptote of $y = 0.200$ and Oblique Asymptote of $y = 5x + 19$
 - D. Horizontal Asymptote of $y = 0.200$
 - E. Oblique Asymptote of $y = 5x + 19$.
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3. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{6x^3 + 13x^2 - 13x - 30}{2x^2 - 9x + 9}$$

- A. Horizontal Asymptote of $y = 3.0$
- B. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 3x + 20$

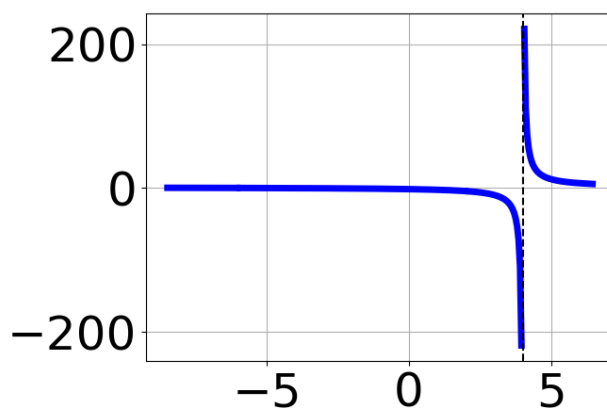
- C. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 3x + 20$
- D. Horizontal Asymptote at $y = 3.0$
- E. Oblique Asymptote of $y = 3x + 20$.
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4. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 + 71x^2 + 102x + 40}{8x^2 - 2x - 15}$$

- A. Vertical Asymptote of $x = 1.5$ and hole at $x = -1.25$
- B. Holes at $x = 1.5$ and $x = -1.25$ with no vertical asymptotes.
- C. Vertical Asymptotes of $x = 1.5$ and $x = -1.25$ with no holes.
- D. Vertical Asymptote of $x = 1.5$ and hole at $x = -1.25$
- E. Vertical Asymptotes of $x = 1.5$ and $x = -0.667$ with a hole at $x = -1.25$
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5. Which of the following functions *could* be the graph below?



- A. $f(x) = \frac{x^3 + 11x^2 + 16x - 84}{x^3 - 28x + 48}$
- B. $f(x) = \frac{x^3 - 11x^2 + 16x + 84}{x^3 - 28x - 48}$

C. $f(x) = \frac{x^3 - 11x^2 + 16x + 84}{x^3 - 28x - 48}$

D. $f(x) = \frac{x^3 + 10x^2 + 17x - 28}{x^3 - 28x + 48}$

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

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

$$f(x) = \frac{12x^3 - 13x^2 - 5x + 6}{9x^2 - 6x - 8}$$

- A. Vertical Asymptotes of $x = 1.333$ and $x = 0.75$ with a hole at $x = -0.667$
- B. Vertical Asymptote of $x = 1.333$ and hole at $x = -0.667$
- C. Vertical Asymptote of $x = 1.333$ and hole at $x = -0.667$
- D. Holes at $x = 1.333$ and $x = -0.667$ with no vertical asymptotes.
- E. Vertical Asymptotes of $x = 1.333$ and $x = -0.667$ with no holes.
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7. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{8x^3 - 6x^2 - 65x + 75}{4x^3 + 6x^2 + 13x - 60}$$

- A. Vertical Asymptote of $y = -3$
- B. Vertical Asymptote of $y = -4.000$
- C. Horizontal Asymptote of $y = 2.000$
- D. None of the above
- E. Horizontal Asymptote of $y = 0$
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8. Determine the horizontal and/or oblique asymptotes in the rational

function below.

$$f(x) = \frac{9x^3 - 30x^2 - 11x + 60}{3x^2 - 5x - 12}$$

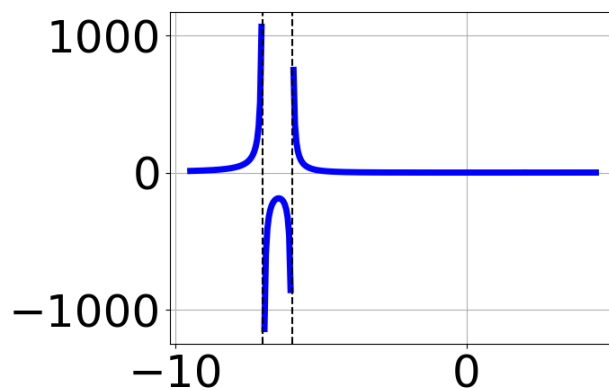
- A. Oblique Asymptote of $y = 3x - 5$.
 - B. Horizontal Asymptote of $y = 3.0$
 - C. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 3x - 5$
 - D. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 3x - 5$
 - E. Horizontal Asymptote at $y = 3.0$
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9. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{9x^3 - 27x^2 - 4x + 12}{9x^2 - 9x - 10}$$

- A. Vertical Asymptotes of $x = 1.667$ and $x = -0.667$ with no holes.
 - B. Vertical Asymptote of $x = 1.0$ and hole at $x = -0.667$
 - C. Vertical Asymptote of $x = 1.667$ and hole at $x = -0.667$
 - D. Vertical Asymptotes of $x = 1.667$ and $x = 0.667$ with a hole at $x = -0.667$
 - E. Holes at $x = 1.667$ and $x = -0.667$ with no vertical asymptotes.
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10. Which of the following functions *could* be the graph below?



A. $f(x) = \frac{x^3 + 4x^2 - 4x - 16}{x^3 - 11x^2 + 16x + 84}$

B. $f(x) = \frac{x^3 - 4x^2 - 4x + 16}{x^3 + 11x^2 + 16x - 84}$

C. $f(x) = \frac{x^3 + 2x^2 - 16x - 32}{x^3 + 11x^2 + 16x - 84}$

D. $f(x) = \frac{x^3 + 4x^2 - 4x - 16}{x^3 - 11x^2 + 16x + 84}$

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