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

$$f(x) = \frac{16x^3 - 40x^2 + x + 30}{8x^2 - 30x + 25}$$

   A. Vertical Asymptotes of $x = 2.5$ and $x = 1.25$ with no holes.

   B. Vertical Asymptote of $x = 2.0$ and hole at $x = 1.25$

   C. Vertical Asymptotes of $x = 2.5$ and $x = -0.75$ with a hole at $x = 1.25$

   D. Vertical Asymptote of $x = 2.5$ and hole at $x = 1.25$

   E. Holes at $x = 2.5$ and $x = 1.25$ with no vertical asymptotes.

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

$$f(x) = \frac{4x^3 - 20x^2 + x + 60}{4x^2 + 16x + 15}$$

   A. Holes at $x = -2.5$ and $x = -1.5$ with no vertical asymptotes.

   B. Vertical Asymptotes of $x = -2.5$ and $x = 2.5$ with a hole at $x = -1.5$

   C. Vertical Asymptote of $x = 1.0$ and hole at $x = -1.5$

   D. Vertical Asymptotes of $x = -2.5$ and $x = -1.5$ with no holes.

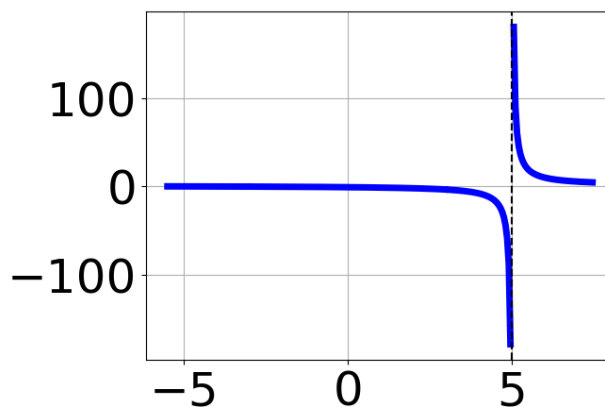   E. Vertical Asymptote of $x = -2.5$ and hole at $x = -1.5$

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

$$f(x) = \frac{24x^3 + 74x^2 - 9x - 45}{12x^3 + 2x^2 - 39x - 45}$$

   A. Vertical Asymptote of $y = -3$

   B. Horizontal Asymptote of $y = 0$

   C. Horizontal Asymptote of $y = 2.000$

   D. None of the above

E. Vertical Asymptote of $y = 1.500$

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

A. $f(x) = \dfrac{x^3 - 4x^2 - 9x + 36}{x^3 + 5x^2 - 9x - 45}$

B. $f(x) = \dfrac{x^3 - 4x^2 - 9x + 36}{x^3 + 5x^2 - 9x - 45}$

C. $f(x) = \dfrac{x^3 - 1x^2 - 16x + 16}{x^3 - 5x^2 - 9x + 45}$

D. $f(x) = \dfrac{x^3 + 4x^2 - 9x - 36}{x^3 - 5x^2 - 9x + 45}$

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

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5. Determine the horizontal and/or oblique asymptotes in the rational function below.
$$f(x) = \frac{9x^3 + 18x^2 - 37x - 30}{3x^2 - 17x + 20}$$

A. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 3x + 23$

B. Horizontal Asymptote of $y = 4.0$ and Oblique Asymptote of $y = 3x + 23$

C. Horizontal Asymptote of $y = 3.0$

D. Horizontal Asymptote at $y = 4.0$

E. Oblique Asymptote of $y = 3x + 23$.

6. Determine the horizontal and/or oblique asymptotes in the rational function below.
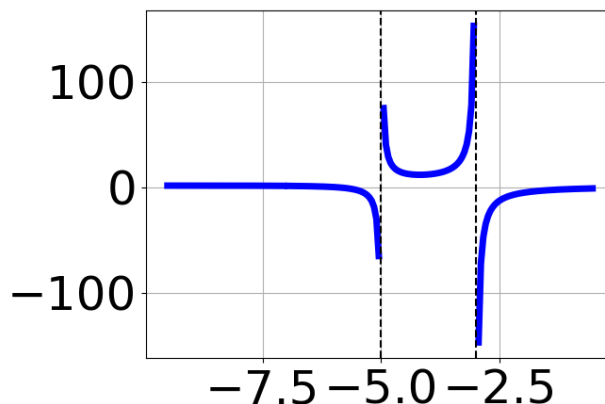
$$f(x) = \frac{3x^2 + 10x - 25}{9x^3 + 18x^2 - 37x - 30}$$

A. Horizontal Asymptote at $y = -5.000$

B. Horizontal Asymptote of $y = 0.333$

C. Oblique Asymptote of $y = 3x - 4$.

D. Horizontal Asymptote of $y = 0$

E. Horizontal Asymptote of $y = 0.333$ and Oblique Asymptote of $y = 3x - 4$

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

$$f(x) = \frac{6x^3 - 1x^2 - 27x - 20}{12x^2 + 31x + 20}$$

A. Vertical Asymptotes of $x = -1.25$ and $x = -1.333$ with no holes.

B. Vertical Asymptote of $x = 0.5$ and hole at $x = -1.333$

C. Vertical Asymptotes of $x = -1.25$ and $x = 2.5$ with a hole at $x = -1.333$

D. Holes at $x = -1.25$ and $x = -1.333$ with no vertical asymptotes.

E. Vertical Asymptote of $x = -1.25$ and hole at $x = -1.333$

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

A. $f(x) = \dfrac{x^3 + 2x^2 - 20x + 24}{x^3 + 15x^2 + 71x + 105}$

B. $f(x) = \dfrac{x^3 - 11x^2 + 16x + 84}{x^3 - 15x^2 + 71x - 105}$

C. $f(x) = \dfrac{x^3 - 11x^2 + 16x + 84}{x^3 - 15x^2 + 71x - 105}$

D. $f(x) = \dfrac{x^3 + 11x^2 + 16x - 84}{x^3 + 15x^2 + 71x + 105}$

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

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

$$f(x) = \frac{8x^3 - 54x^2 + 103x - 60}{4x^2 + 3x - 10}$$

A. Horizontal Asymptote of $y = -2.0$ and Oblique Asymptote of $y = 2x - 15$

B. Horizontal Asymptote at $y = -2.0$

C. Oblique Asymptote of $y = 2x - 15$.

D. Horizontal Asymptote of $y = 2.0$

E. Horizontal Asymptote of $y = 2.0$ and Oblique Asymptote of $y = 2x - 15$

10. Determine the vertical asymptotes and holes in the rational function below.
$$f(x) = \frac{12x^3 + 79x^2 + 144x + 80}{8x^2 + 30x + 25}$$

A. Holes at $x = -2.5$ and $x = -1.25$ with no vertical asymptotes.

B. Vertical Asymptote of $x = 1.5$ and hole at $x = -1.25$

C. Vertical Asymptote of $x = -2.5$ and hole at $x = -1.25$

D. Vertical Asymptotes of $x = -2.5$ and $x = -1.333$ with a hole at $x = -1.25$

E. Vertical Asymptotes of $x = -2.5$ and $x = -1.25$ with no holes.