



Rational Functions and Asymptotes - Hole or Vertical Asymptote (Factored)

1 Is there a hole or a vertical asymptote at $x=-1$ when this polynomial is divided by this binomial?

$$f(x) = \frac{(x+4)(x-2)(x-4)}{(x+4)(x+1)(x-4)}$$

- | | | | |
|---|---------|---|--------------------|
| A | Hole | B | Vertical Asymptote |
| C | Neither | | |

2 Is there a hole or a vertical asymptote at $x=3$ when this polynomial is divided by this binomial?

$$f(x) = \frac{(x+3)x}{(x+4)(x+1)x}$$

- | | | | |
|---|--------------------|---|---------|
| A | Vertical Asymptote | B | Neither |
| C | Hole | | |

3 Is there a hole or a vertical asymptote at $x=4$ when this polynomial is divided by this binomial?

$$f(x) = \frac{(x+3)(x+1)(x-4)}{(x+3)(x+1)x}$$

- | | | | |
|---|--------------------|---|------|
| A | Vertical Asymptote | B | Hole |
| C | Neither | | |

4 Is there a hole or a vertical asymptote at $x=3$ when this polynomial is divided by this binomial?

$$f(x) = \frac{(x+3)(x+2)(x-4)}{(x+3)(x-3)(x-4)}$$

- | | | | |
|---|--------------------|---|------|
| A | Vertical Asymptote | B | Hole |
| C | Neither | | |

5 Is there a hole or a vertical asymptote at $x=0$ when this polynomial is divided by this binomial?

$$f(x) = \frac{x(x-2)(x-4)}{x(x-3)(x-4)}$$

- | | | | |
|---|---------|---|--------------------|
| A | Neither | B | Vertical Asymptote |
| C | Hole | | |

6 Is there a hole or a vertical asymptote at $x=-1$ when this polynomial is divided by this binomial?

$$f(x) = \frac{(x+3)(x+2)(x-4)}{(x+1)(x-4)}$$

- | | | | |
|---|--------------------|---|------|
| A | Vertical Asymptote | B | Hole |
| C | Neither | | |

7 Is there a hole or a vertical asymptote at $x=-2$ when this polynomial is divided by this binomial?

$$f(x) = \frac{(x+3)(x-2)(x-4)}{(x+3)(x+2)(x-2)}$$

- | | | | |
|---|--------------------|---|---------|
| A | Vertical Asymptote | B | Neither |
| C | Hole | | |

8 Is there a hole or a vertical asymptote at $x=3$ when this polynomial is divided by this binomial?

$$f(x) = \frac{(x+2)(x+1)}{(x+1)(x-3)}$$

- | | | | |
|---|--------------------|---|---------|
| A | Vertical Asymptote | B | Neither |
| C | Hole | | |