Name



Identify holes and asymptotes of rational functions

1

What are the degrees of the numerator and denominator of this rational function?

$$f(x) = \frac{5(x+4)(x-1)(x-3)}{5(x+2)(x+1)(x-2)}$$

A
Numerator degree: 3
Denominator degree: 3

B
Numerator degree: 1
Denominator degree: 1

C
Numerator degree: 2
Denominator degree: 2

D
Numerator degree: 1
Denominator degree: 2

2

Which numerator and denominator degrees would give this horizontal or slant asymptote?

Slant asymptote

A
Numerator degree: 2
Denominator degree: 3

B
Numerator degree: 2
Denominator degree: 1

C
Numerator degree: 1
Denominator degree: 3

D
Numerator degree: 1
Denominator degree: 1

3

What type of horizontal or slant asymptote does a rational function with these degrees have?

Numerator degree: 3
Denominator degree: 3

A
Horizontal asymptote (not at zero)

B
No horizontal or slant asymptote

C
Slant asymptote

D
Horizontal asymptote (at zero)

4

Based on the order of the polynomials in the numerator and denominator, which function would have these horizontal or slant asymptotes?

Horizontal asymptote (not at zero)

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

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

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

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

Name

Identify holes and asymptotes of rational functions

5

Does this rational function have a vertical asymptote?

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

A	B
Yes	No

6

What is the vertical asymptote of this rational function?

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

A

Vertical asymptote at $x = -3$

B

Vertical asymptote at $x = 0$

C

Vertical asymptote at $x = 3$

D

Vertical asymptote at $x = -1$

7

Is there a hole at x=-3 when this polynomial is divided by this binomial?

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

A	B
Yes	No

8

Where are the holes when this polynomial is divided by this binomial?

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

A	$x = -4$
B	$x = 4$
C	$x = 0$
D	No holes

9

What is the vertical asymptote of this rational function?

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

A

Vertical asymptote at $x = -2$

B

Vertical asymptote at $x = -4$

C

Vertical asymptote at $x = 4$

D

Vertical asymptote at $x = 2$

10

Is there a hole at x=-4 when this polynomial is divided by this binomial?

$$f(x) = \frac{x^2-2x-8}{x^2-6x+8}$$

A	B
Yes	No

Name

Identify holes and asymptotes of rational functions



11

Where are the holes when this polynomial is divided by this binomial?

$$f(x) = \frac{3x+6}{x^2+5x+6}$$

A $x = -2$

B No holes

C $x = 2$

D $x = -3$

12

What is the horizontal asymptote of this rational function?

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

A Horizontal asymptote at $y = 0$

B Horizontal asymptote at $y = 3$

C Horizontal asymptote at $y = 5$

D Horizontal asymptote at $y = 1$

13

What are the vertical asymptotes of this rational function?

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

A Vertical asymptote at $x = 3$

B Vertical asymptotes at $x = -1,\ x = 0$

C Vertical asymptotes at $x = 0,\ x = 1$

D Vertical asymptote at $x = -3$

14

Based on the order of polynomials in the numerator and denominator, what type of horizontal or slant asymptotes would this expression have?

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

A No horizontal or slant asymptote

B Horizontal asymptote (not at zero)

C Horizontal asymptote (at zero)

D Slant asymptote

15

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

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

A Hole

B Neither

C Vertical Asymptote

Name

Identify holes and asymptotes of rational functions



16

What is the horizontal asymptote of this rational function?

$$f(x) = \frac{-2x + 4}{5x}$$

A

Horizontal asymptote at $y = \frac{-2}{5}$

B

Horizontal asymptote at $y = \frac{-8}{3}$

C

Horizontal asymptote at $y = \frac{-5}{2}$

D

Horizontal asymptote at $y = 0$

17

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

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

A Hole

B Vertical Asymptote

C Neither

18

What are the vertical asymptotes of this rational function?

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

A

Vertical asymptotes at $x = -2,\ x = -1$

B

Vertical asymptote at $x = -2$

C

Vertical asymptote at $x = 2$

D

Vertical asymptotes at $x = 1,\ x = 2$