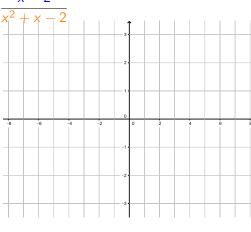
Example: Sketch the graph of: $f(x) = \frac{x-2}{x^2 + x - 2}$

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

Example: Sketch the graph of:

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

We need to find:

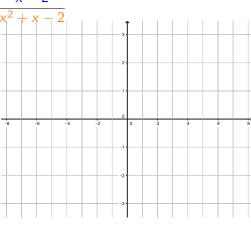


Example: Sketch the graph of:

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

We need to find:

The y-int



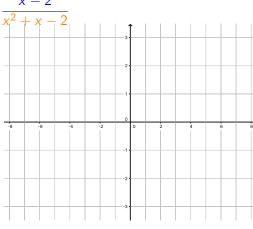
Example: Sketch the graph of:

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

We need to find:

The y-int

The x-int



Example: Sketch the graph of:

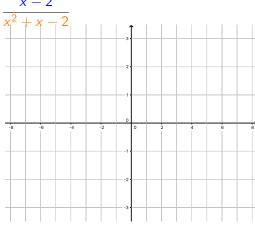
$$(x) = \frac{x-2}{x}$$

We need to find:

The y-int

The x-int

Vertical asymptotes



Example: Sketch the graph of:

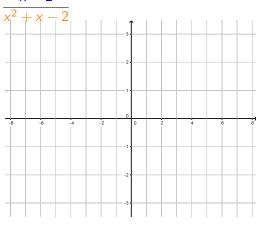
$$f(x) = \frac{x-2}{x^2}$$

We need to find:

The y-int

The x-int

Vertical asymptotes



Example: Sketch the graph of:

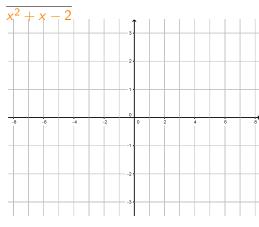
$$f(x) = \frac{x-2}{x^2+x^2}$$

We need to find:

The y-int: x = 0

The x-int

Vertical asymptotes



Example: Sketch the graph of:

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

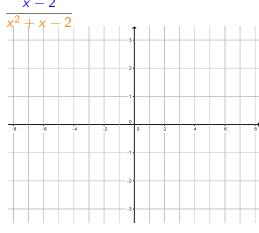
We need to find:

The y-int: x = 0

$$f(0) = \frac{0-2}{0^2+0-2} = 1 \rightarrow (0,1)$$

The x-int

Vertical asymptotes



Example: Sketch the graph of:

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

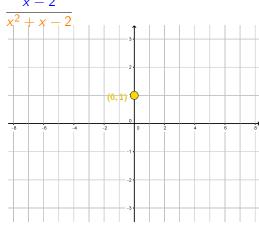
We need to find:

The y-int: x = 0

$$f(0) = \frac{0-2}{0^2+0-2} = 1 \rightarrow (0,1)$$

The x-int

Vertical asymptotes



Example: Sketch the graph of:

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

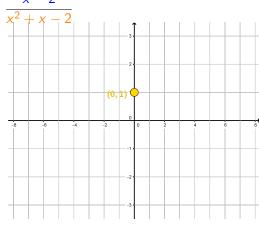
We need to find:

The y-int: x = 0

$$f(0) = \frac{0-2}{0^2+0-2} = 1 \rightarrow (0,1)$$

The x-int: y = f(x) = 0





Example: Sketch the graph of:

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

We need to find:

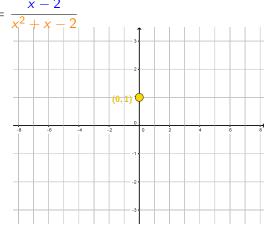
The y-int: x = 0

$$f(0) = \frac{0-2}{0^2+0-2} = 1 \rightarrow (0,1)$$

The
$$x$$
-int: $y = f(x) = 0$

We need to solve
$$0 = \frac{x-2}{y^2+y-2}$$

Vertical asymptotes



Example: Sketch the graph of:

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

We need to find:

The y-int: x = 0

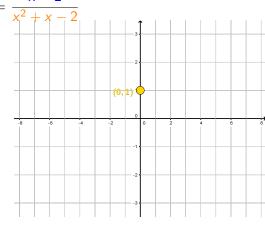
$$f(0) = \frac{0-2}{0^2+0-2} = 1 \to (0,1)$$

The
$$x$$
-int: $y = f(x) = 0$

We need to solve
$$0 = \frac{x-2}{x^2+x-2}$$

We can by solving:
$$0 = x - 2$$

Vertical asymptotes



Example: Sketch the graph of:

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

We need to find:

The
$$y$$
-int: $x = 0$

$$f(0) = \frac{0-2}{0^2+0-2} = 1 \rightarrow (0,1)$$

The x-int:
$$y = f(x) = 0$$

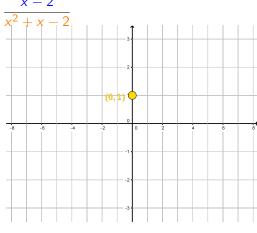
We need to solve
$$0 = \frac{x-2}{x^2+x-2}$$

We can by solving:
$$0 = x - 2$$

We can by solving:
$$0 = x -$$

This gives: x = 2

Vertical asymptotes



Example: Sketch the graph of:

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

We need to find:

The *y*-int:
$$x = 0$$

$$f(0) = \frac{0-2}{0^2+0-2} = 1 \rightarrow (0,1)$$

The
$$x$$
-int: $y = f(x) = 0$

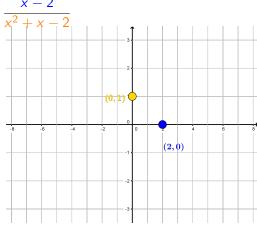
We need to solve
$$0 = \frac{x-2}{x^2+x-2}$$

We can by solving:
$$0 = x - 2$$

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This gives: x = 2

Vertical asymptotes



Example: Sketch the graph of:

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We need to find:

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$$y$$
-int: $x = 0$

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The
$$x$$
-int: $y = f(x) = 0$

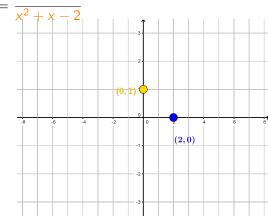
We need to solve
$$0 = \frac{x-2}{x^2+x-2}$$

We can by solving:
$$0 = x - 2$$

This gives: x = 2

Vertical asymptotes:

$$x^2 + x - 2 = 0$$



Example: Sketch the graph of:

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

We need to find:

The y-int: x = 0

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$$x$$
-int: $y = f(x) = 0$

We need to solve
$$0 = \frac{x-2}{x^2+x-2}$$

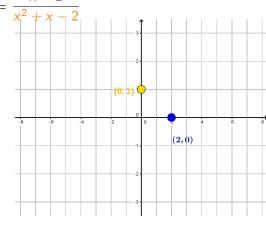
We can by solving:
$$0 = x - 2$$

This gives: x = 2

Vertical asymptotes:

$$x^2 + x - 2 = 0$$

▶ Solving this polynomial gives:



Example: Sketch the graph of:

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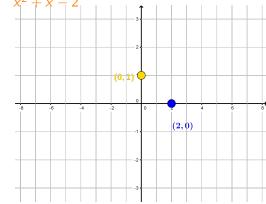
We need to solve
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We can by solving:
$$0 = x - 2$$

This gives: x = 2

Vertical asymptotes:

$$x^2 + x - 2 = 0$$



Solving this polynomial gives: x=1, x=-2

Example: Sketch the graph of:

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

We need to find:

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$$y$$
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The
$$x$$
-int: $y = f(x) = 0$

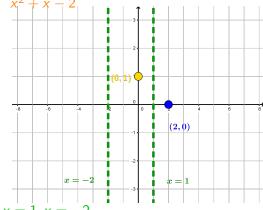
We need to solve
$$0 = \frac{x-2}{x^2+x-2}$$

We can by solving:
$$0 = x - 2$$

This gives: x = 2

Vertical asymptotes:

$$x^2 + x - 2 = 0$$



Solving this polynomial gives: x = 1, x = -2

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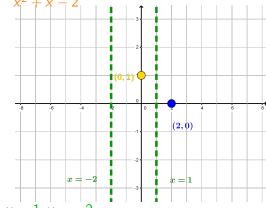
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This gives: x = 2

Vertical asymptotes:

$$x^2 + x - 2 = 0$$



Solving this polynomial gives: x=1, x=-2

The End Behavior: $x \to \pm \infty$

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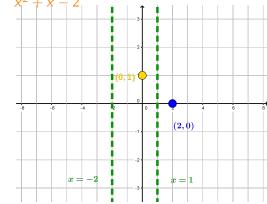
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Vertical asymptotes:

$$x^2 + x - 2 = 0$$

Solving this polynomial gives: x = 1, x = -2

The End Behavior:
$$x \to \pm \infty$$

• We saw that
$$\frac{x-2}{x^2+x-2} \approx 0$$
 since $deg(x-2) < deg(x^2+x-2)$

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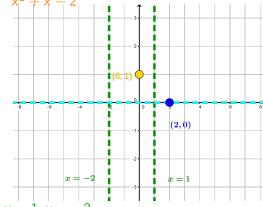
We need to solve
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We can by solving:
$$0 = x - 2$$

This gives: x = 2

Vertical asymptotes:

$$x^2 + x - 2 = 0$$



Solving this polynomial gives:
$$x = 1, x = -2$$

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We can by solving:
$$0 = x - 2$$

This gives: x = 2

Vertical asymptotes:

$$x^2 + x - 2 = 0$$

(2,0)

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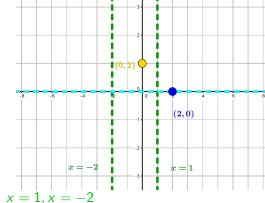
The
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-int: $y = f(x) = 0$

We need to solve $0 = \frac{x-2}{x^2+x-2}$

We can by solving: 0 = x - 2

This gives: x = 2

Vertical asymptotes: $x^2 + x - 2 = 0$



Solving this polynomial gives:
$$x = 1, x = -2$$

The End Behavior: $x \to \pm \infty$

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-int: $x = 0$

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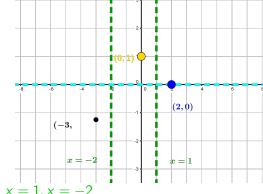
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We need to solve $0 = \frac{x-2}{x^2+x-2}$

We can by solving: 0 = x - 2

This gives: x = 2

Vertical asymptotes: $x^2 + x - 2 = 0$



Solving this polynomial gives: x=1, x=-2

The End Behavior:
$$x \to \pm \infty$$

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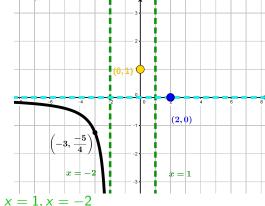
The x-int:
$$y = f(x) = 0$$

We need to solve $0 = \frac{x-2}{x^2+x-2}$

We can by solving: 0 = x - 2

This gives: x = 2

Vertical asymptotes: $x^2 + x - 2 = 0$



Solving this polynomial gives:
$$x = 1, x = -2$$

The End Behavior: $x \to \pm \infty$

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We need to find:

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We need to solve $0 = \frac{x-2}{x^2+x-2}$

We can by solving: 0 = x - 2

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Vertical asymptotes: $x^2 + x - 2 = 0$

Solving this polynomial gives:
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Vertical asymptotes:

$$x^2 + x - 2 = 0$$

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(1.5.)

Example: Sketch the graph of:

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

We need to find:

The y-int:
$$x = 0$$

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We need to solve $0 = \frac{x-2}{x^2+x-2}$

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(1.5, -.29)

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Vertical asymptotes:

$$x^2 + x - 2 = 0$$

Solving this polynomial gives:
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The x-int:
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We need to solve $0 = \frac{x-2}{\sqrt{2}+\sqrt{2}}$

We can by solving: 0 = x - 2

we can by solving: 0 = x -

This gives: x = 2

Vertical asymptotes:
$$x^2 + x - 2 = 0$$

Solving this polynomial gives:
$$x = 1, x = -2$$

The End Behavior: $x \to \pm \infty$

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We need to find:

The y-int:
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$$y = f(x) = 0$$

The
$$x$$
-int: $y = I(x) =$

We need to solve
$$0 = \frac{x-2}{x^2+x-2}$$

We can by solving: 0 = x - 2

This gives: x = 2

Vertical asymptotes: $x^2 + x - 2 = 0$

$$(0,1)$$

$$(4,.11)$$

$$(1.5,-.29)$$

$$(2,0)$$

$$x = -2$$

$$x = 1$$

Solving this polynomial gives:
$$x=1, x=-2$$

The End Behavior: $x\to\pm\infty$

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Vertical asymptotes:

$$x^2 + x - 2 = 0$$

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The End Behavior:
$$x \to \pm \infty$$

We saw that
$$\frac{x-2}{x^2+x-2} \approx 0$$
 since $deg(x-2) < deg(x^2+x-2)$

Like Polynomials we need to check if f(x) > 0 or f(x) < 0 on some intervals. Since there are no more x—int we know where f(x) can change sign

(4, .11)

(1.5, -.29)