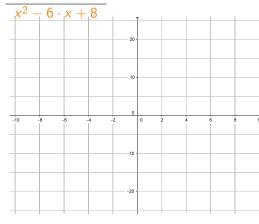
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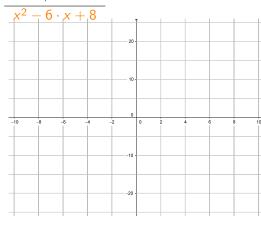
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The y-int

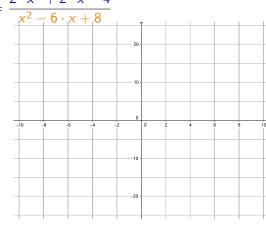


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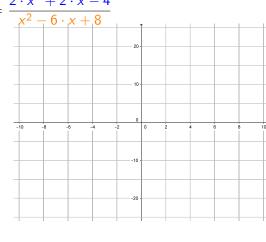
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The x-int

Vertical asymptotes



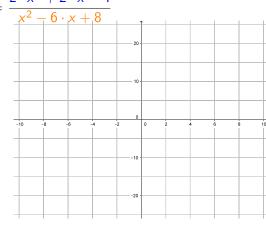
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Vertical asymptotes



Graphing Rational Functions - Example 6 Example: Sketch the graph of: $f(x) = \frac{2 \cdot x^2 + 2 \cdot x - 4}{x^2 - 6 \cdot x + 8}$

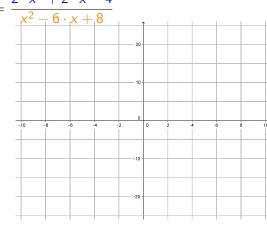
$$f(x) = \frac{2 \cdot x^2 + 2 \cdot x - 4}{x^2 - 6 \cdot x + 8}$$

We need to find:

The y-int: x = 0

The x-int

Vertical asymptotes



Example: Sketch the graph of:
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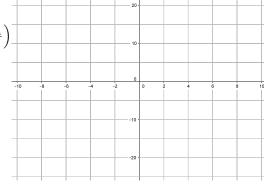
We need to find:

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The x-int

Vertical asymptotes



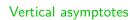
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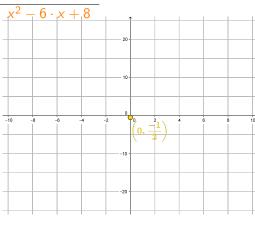
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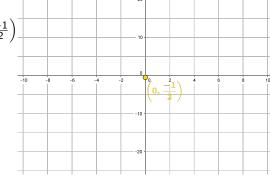
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Vertical asymptotes

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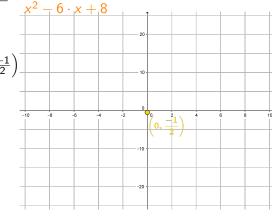
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We solve:
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Vertical asymptotes





Graphing Rational Functions - Example 6 Example: Sketch the graph of: $f(x) = \frac{2 \cdot x^2 + 2 \cdot x - 4}{\frac{x^2 - 6 \cdot x + 8}{2}}$

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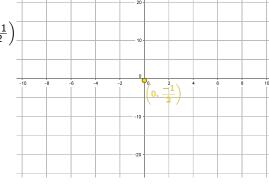
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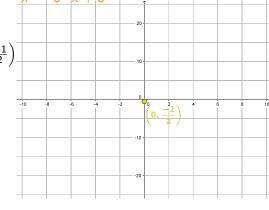
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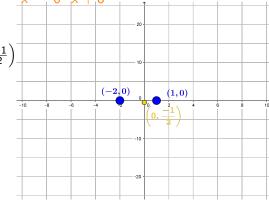
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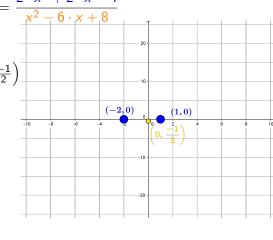
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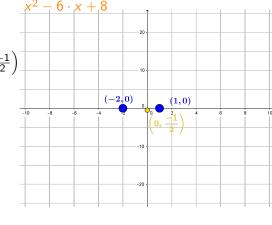
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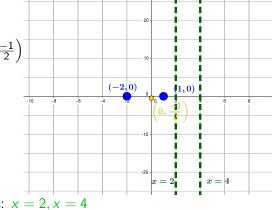
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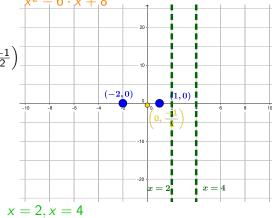
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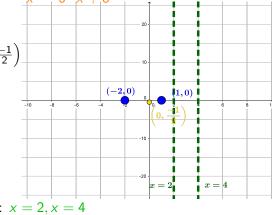
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Vertical asymptotes: $x^2 - 6 \cdot x + 8 = 0$

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The End Behavior: $x \to \pm \infty$ Called a Horizontal Asymptote

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Like Polynomials we need to check if f(x)>0 or f(x)<0 on some intervals

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$$0 - \frac{2 \cdot x^2 + 2 \cdot x - 4}{2 \cdot x^2 + 2 \cdot x - 4}$$

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-2,0) -1,0

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$$0 = \frac{2 \cdot x^2 + 2 \cdot x - 4}{x^2 - 6 \cdot x + 8}$$

We can by solving:

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The End Behavior: $x \to \pm \infty$ Called a Horizontal Asymptote

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This gives: $x = 1, -2$

Vertical asymptotes:

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(1.5)

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(1.5, 2.8)

We need to find:

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

$$f(0) = \frac{2 \cdot 0^2 + 2 \cdot 0 - 4}{0^2 - 6 \cdot 0 + 8} = \frac{-1}{2} : \left(0, \frac{-1}{2}\right)$$

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

We solve:
$$0 = \frac{2 \cdot x^2 + 2 \cdot x - 4}{x^2 - 6 \cdot x + 8}$$

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This gives: $x = 1, -2$

Vertical asymptotes:

$$x^2 - 6 \cdot x + 8 = 0$$
Solving this polynomial gives: $x = 2, x = 4$

The End Behavior: $x \to \pm \infty$ Called a Horizontal Asymptote

We saw
$$\frac{2 \cdot x^2 + 2 \cdot x - 4}{x^2 - 6 \cdot x + 8} \approx \frac{2}{1} = 2$$
 since $dg(2x^2 + 2x - 4) = dg(x^2 - 6x + 8)$

Example: Sketch the graph of:

$$f(x) = \frac{2 \cdot x^2 + 2 \cdot x - 4}{x^2 - 6 \cdot x + 8}$$

(1.5, 2.8)

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