

3.5 Curve sketching

Curve sketching

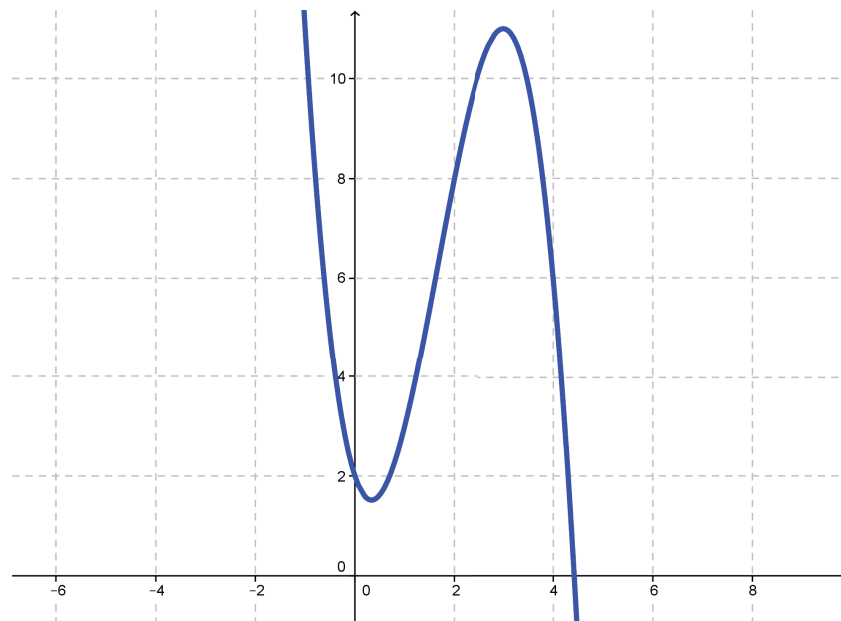
- ① Find the domain of f .
- ② Find critical values of f and where f is increasing/decreasing.
- ③ Find possible inflection points of f and where f is concave up/concave down.
- ④ Find any vertical asymptotes.
- ⑤ Find any horizontal asymptotes.
- ⑥ Evaluate f at each critical point and possible point of inflections, and connect these points with curves of the proper concavity.

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Example

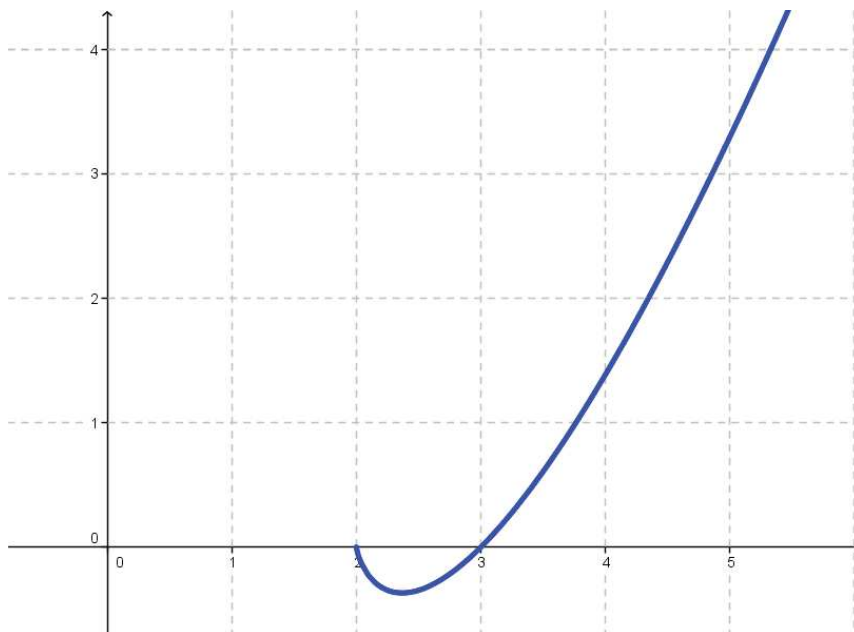
- ① $f(x) = -x^3 + 5x^2 - 3x + 2$
- ② $f(x) = (x - 2) \ln(x - 2)$
- ③ $f(x) = \sin x \cos x$ on $[-\pi, \pi]$
- ④ $f(x) = \frac{x^2 - 4x + 3}{x^2 - 6x + 8}$

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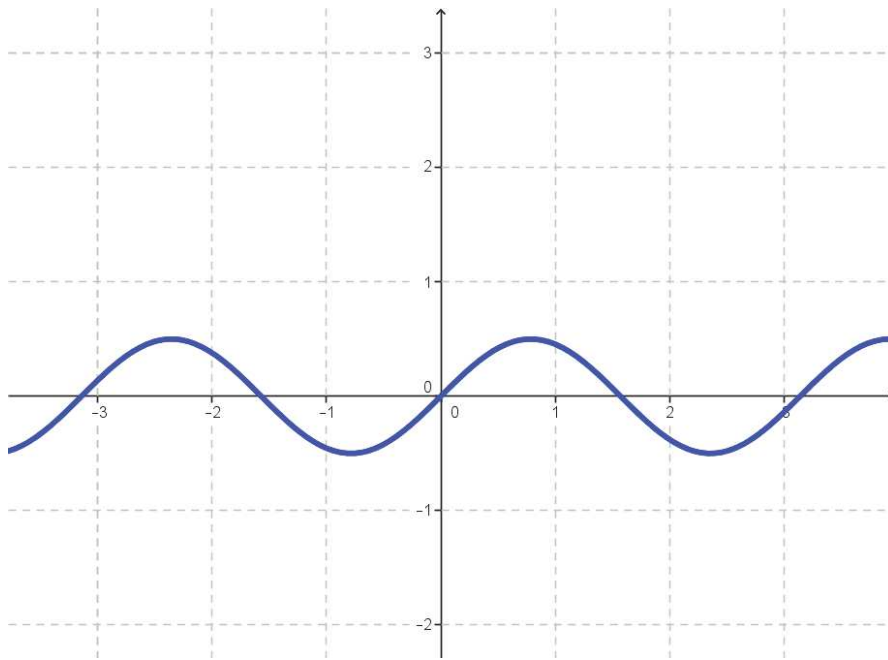
$$f(x) = -x^3 + 5x^2 - 3x + 2$$

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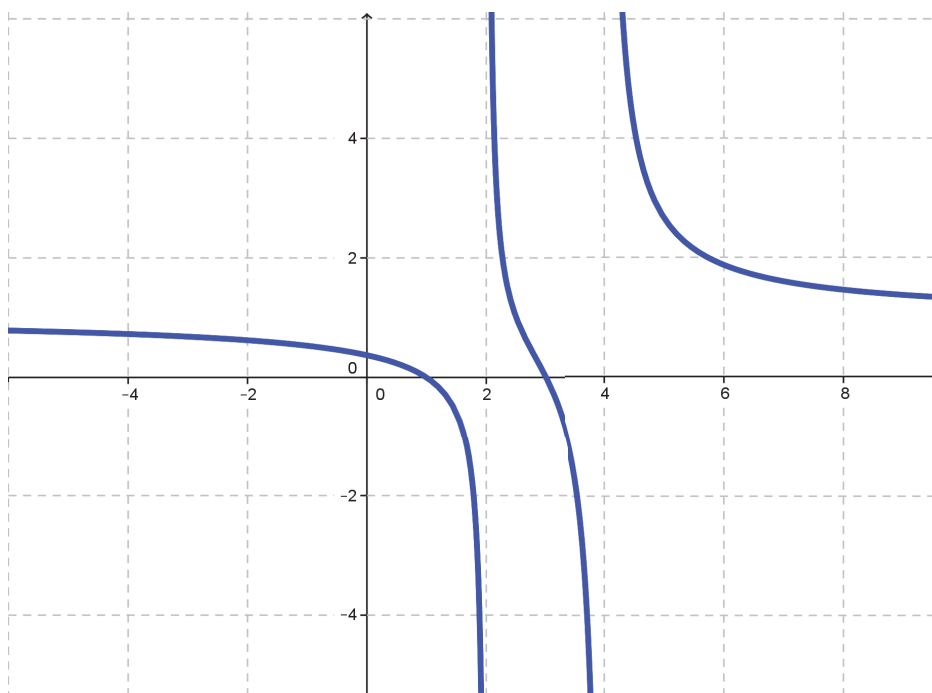
$$f(x) = (x - 2) \ln(x - 2)$$

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$$f(x) = \sin x \cos x \text{ on } [-\pi, \pi]$$

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$$f(x) = \frac{x^2 - 4x + 3}{x^2 - 6x + 8}$$