Group Chat

Given that $y = (x+a)^3$ and $\frac{d^2y}{dx^2} = 6x - 3,$ find the value of a.

*Note: that strange notation that you see means: second derivative

For the function $f(x) = x^3 - 2x^2 + x$, find and classify any turning points.

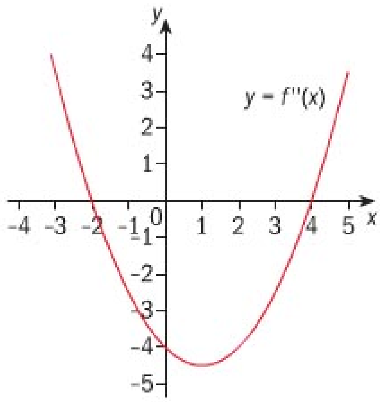
Use both the First Derivative Test *and* the Second Derivative Test.

one more on back

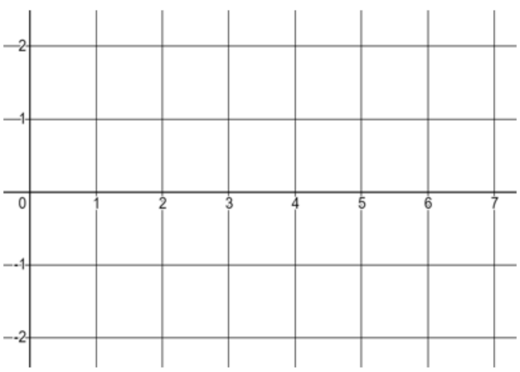
The cubic function $f(x) = x^3 + bx + c$ has a local maximum at $(-1, 3)$. Find the coordinates of the local minimum.

THINK.

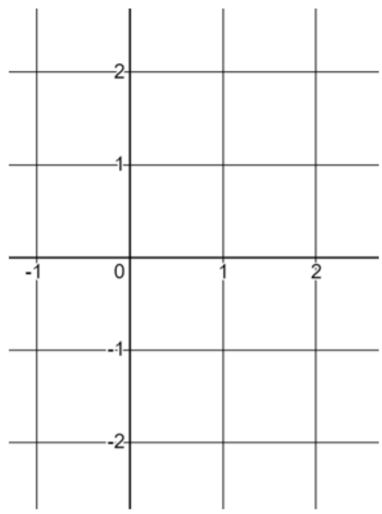
The graph of the *second derivative of* f is shown. Write down the intervals on which f is concave up and concave down. Give the x-coordinates of any inflexion points.



Sketch a possible graph of *f* given that *f'(2) = 0*, *f'(6) = 0* and there is a point of inflexion at x = 4.



Sketch a possible graph of *g* given that *g'(1) = 0* and there is a point of inflexion at x = 1.



Given the function:

$f(x) = 2x^3 - 3x^2 - 12x$

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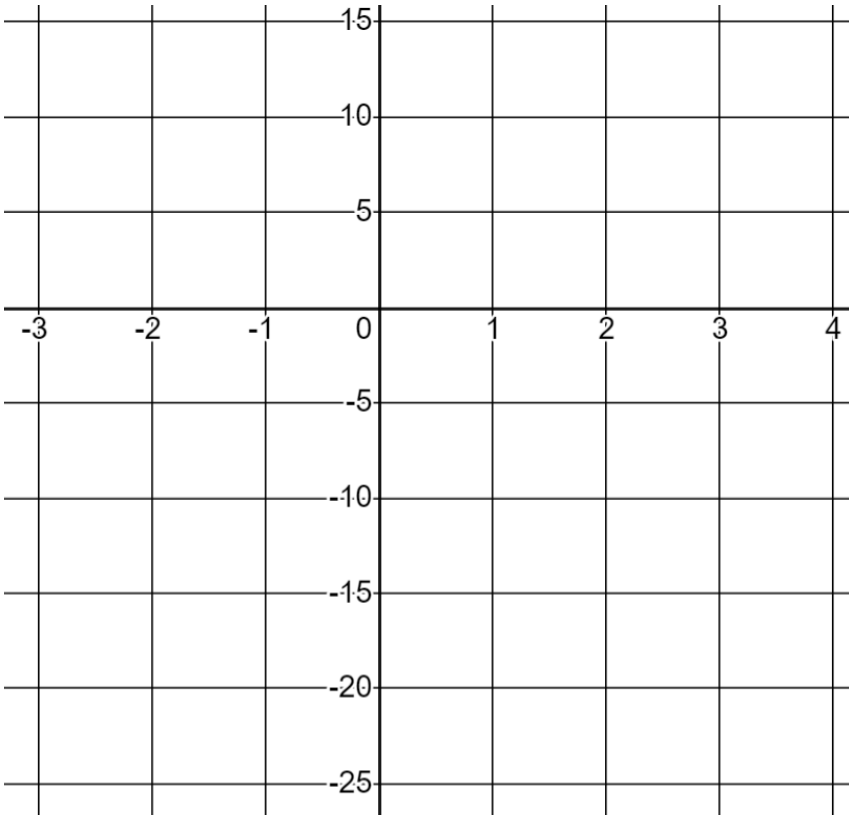
increasing: $(-\infty, -1)$ and $(2, \infty)$
decreasing: $(-1, 2)$
relative maximum: $(-1, 7)$
relative minimum: $(2, -20)$
concave down: $\left(-\infty, \frac{1}{2}\right)$
concave up: $\left(\frac{1}{2}, \infty\right)$
inflexion point: $\left(\frac{1}{2}, -\frac{13}{2}\right)$
x-intercepts: $(0,0)$, $(-1.8, 0)$, $(3.31, 0)$
y-intercept: $(0,0)$

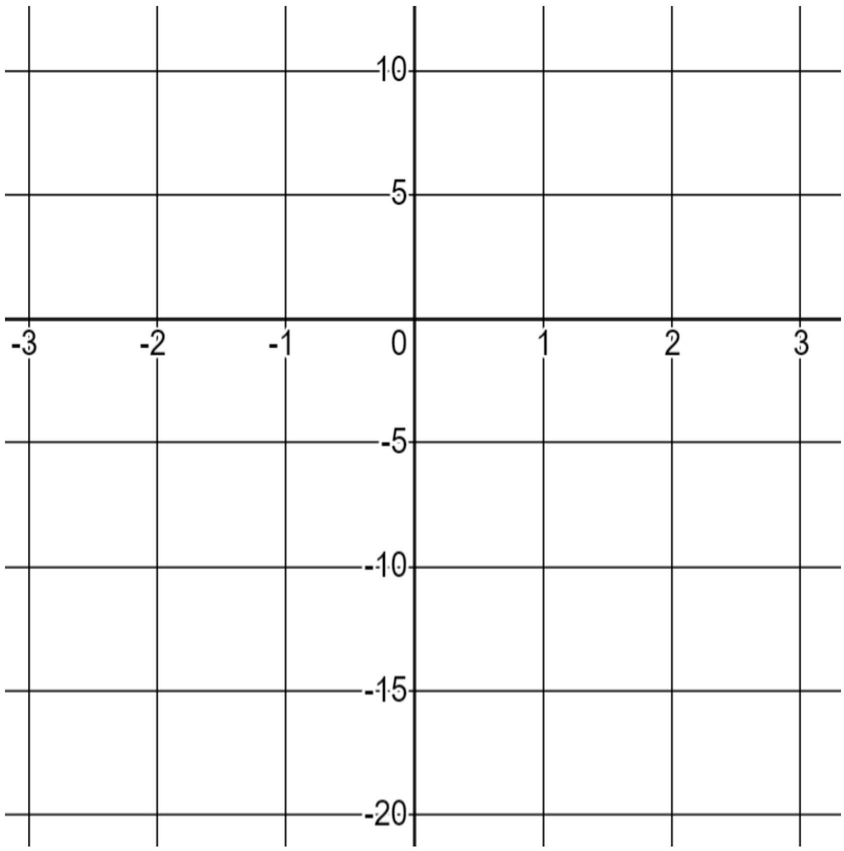


Given the function:

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

$f(x) = \frac{x^2-4}{x^2-1}$
increasing: $(-\infty, -1)$ and $(-1, 0)$
decreasing: $(0, 1)$ and $(1, \infty)$
relative minimum: $(0, 4)$
concave down: $(-\infty, -1)$ and $(1, \infty)$
concave up: $(-1, 1)$
inflexion points: none
x-intercepts: $(2, 0)$, $(-2, 0)$

y-intercept: $(0, 4)$



vertical asymptotes: $x = \pm 1$

horizontal asymptote: $y = 1$

Given the function: $f(x) = 3x^4 + 4x^3 - 2$

a. Find f'(x). Then, find the critical values, max or min points, and periods of increase/decrease.
b. Find f''(x). Then, find the points of inflexion and periods of concavity.
c. Using all the points, sketch a detailed graph of f(x).