In this problem you are going to graph the relation $y = f(x)$. For online reasons, we cannot reveal the formula for f but we will give you all the calculus information you need to make an excellent graph.

- **Domain and Intercepts:** The function f is defined for all $x \neq -2$. It has the following axis intercepts: $x = 0$ and $y = 0$. There are no other axis intercepts.
- **Asymptotes** The graph $y = f(x)$ has a vertical asymptote with equation $x = -2$, a horizontal asymptote with equation $y = 0$ as $x \to \infty$ and horizontal asymptote $y = 0$ as $x \to -\infty$. There is no slant asymptote.
- **First derivative information** The function has a single critical point at $x = 2$ where $f'(2) = 0$. $f(2) = \frac{5}{2}$. The signs of the first derivative are as follows:

range of x	sign of f'
$(-\infty, -2)$	$f' \leq 0$
$(-2, 2]$	$f' \geq 0$
$[2, \infty)$	$f' \leq 0$

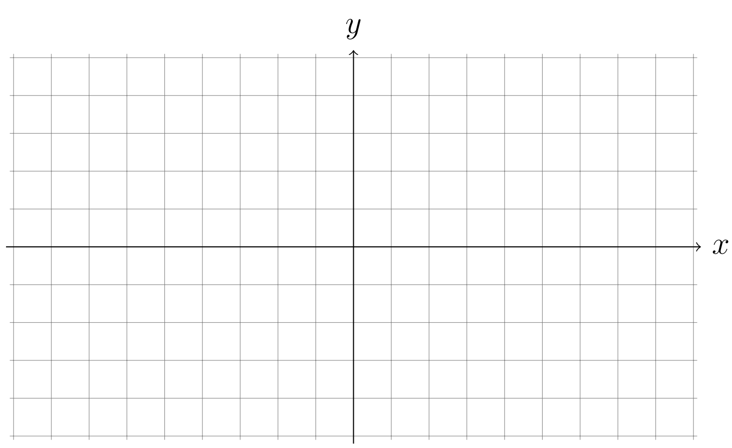
- **Second derivative information** The function f'' has a single root at $x = 4$. The function value at $x = 4$ is $f(4) = \frac{10}{9}$. The signs of the second derivative are as follows.

range of x	sign of f''
$(-\infty, -2)$	$f'' \leq 0$
$(-2, 4]$	$f'' \leq 0$
$[4, \infty)$	$f'' \geq 0$

a)[2] Classify the critical point at $x = 2$ as local max, min or neither. Justify by quoting either the first- or second-derivative test, or other valid method. Draw a number line showing all regions where the graph is increasing or decreasing.

b)[2] Find all inflection points $(x, f(x))$ in the graph $y = f(x)$ and draw a number line showing all regions of concave up and concave down for the graph.

c)[4] On a suitable set of axes, make a neat sketch of $y = f(x)$ that includes ALL information from the discussion above.



Your graph of $y = f(x)$