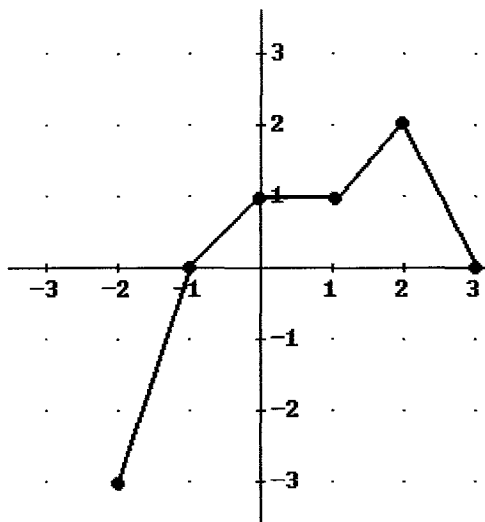


Calculus Worksheet: Limits of Functions (1)

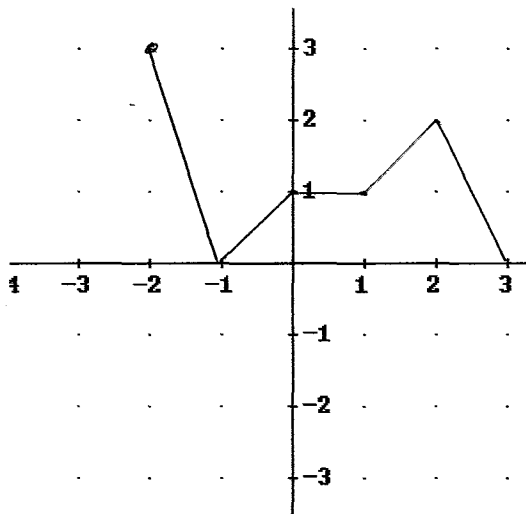
The graph of function f defined on the interval $[-2, 3]$ is shown below.



1. Sketch the graph of $y = |f(x)|$ and find its domain and range.

$$|f(x)| = f(x) \quad \text{if } f(x) \geq 0$$

$$|f(x)| = -f(x) \quad \text{if } f(x) < 0$$



Domain: $[-2, 3]$

range: $[0, 3]$: absolute value of an expression is always 0 or positive.

2. Sketch the graph of $y = f(|x|)$ and find its domain and range.

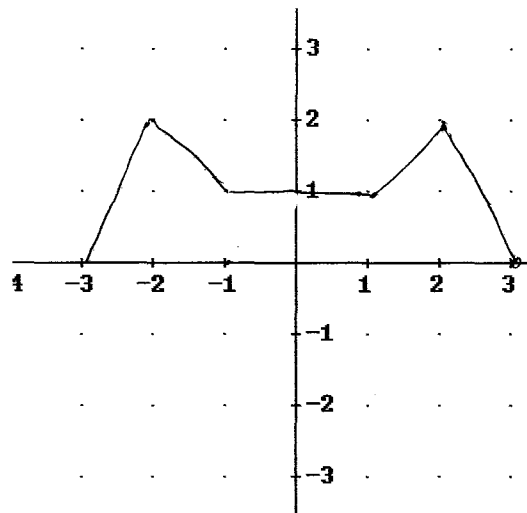
$$f(|x|) = f(x), \quad x \geq 0$$

$$f(|x|) = f(-x), \quad x < 0$$

It is an even function

$$\text{Domain: } [-3, 3]$$

$$\text{range: } [0, 2]$$

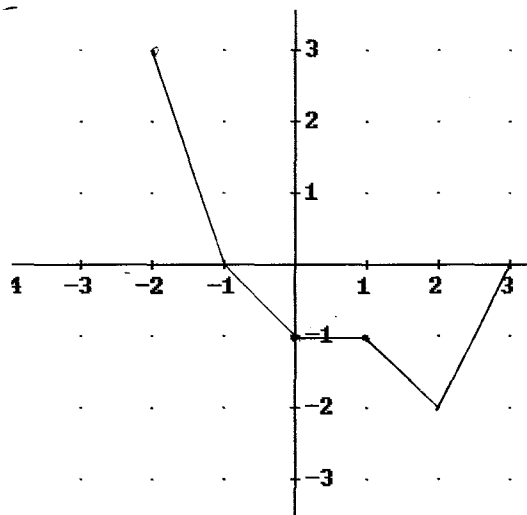


3. Sketch the graph of $y = -f(x)$ and find its domain and range.

reflection on x-axis

$$\text{Domain: } [-2, 3]$$

$$\text{range: } [-2, 3]$$



4. Sketch the graph of $y = f(-x)$ and find its domain and range.

reflection on y -axis.

Domain: $[-3, 2]$

range: $[-3, 2]$

