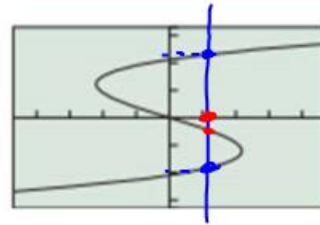
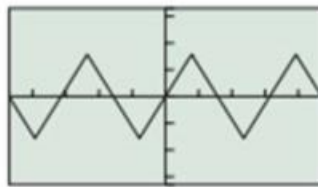
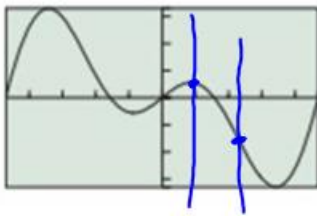


- Reminder Vertical Line Test



Not a Function.

- The value of y depends on x , y is the dependent variable and x is the independent variable

The Domain of some Basic Functions



The machine analogy



Domain

Polynomials

- $3x^2 + 4x$ All real numbers $(-\infty, \infty)$
- $2x^3 + 3x^2 + 2x - 7$ All real numbers $(-\infty, \infty)$
- Volume of a sphere : $v(r) = \frac{4}{3}\pi r^3$ Domain?

cubic

~~$(-\infty, \infty)$~~

$(0, \infty)$

All positive real numbers

The domain should fit the situation
Always Think about restrictions

Find the domain of each of the following functions

✓ • $f(x) = |x + 2|$ A.V

No rest. Domain $(-\infty, \infty)$ All real numbers.

• $f(x) = \sqrt{x}$ Radical

Rest. The quantity under the $\sqrt{\quad}$ cannot be negative
Domain $[0, \infty)$ All positive real numbers.

• $f(x) = \sqrt{x+2}$ Radical

$$\begin{aligned} x+2 &\geq 0 \\ -2 &\quad -2 \\ x &\geq -2 \end{aligned}$$

$[-2, \infty)$
Domain

All real numbers
greater than -2
including -2

• $f(x) = \frac{2}{x}$ Rational

Restriction: The denominator CANNOT be $= 0$

• $f(x) = \frac{2}{x+3}$ $x \neq 0$ Domain $(-\infty, 0) \cup (0, \infty)$
All real numbers excluding 0.

$$x+3 \neq 0$$

$$x \neq -3$$

Domain $(-\infty, -3) \cup (-3, \infty)$

All real numbers excluding -3.