

August 24, 2026

National Waffle Day

Today in History:

Vesuvius erupts (79AD)

Pluto gets demoted (2006)

Number of the Day: 676

$676 = 2 \times 2 \times 13 \times 13$

676 is a perfect square.

676 is the smallest palindromic square whose square root is not palindromic.

Fun Fact:

Only pregnant female polar bears hibernate.

Quote of the Day:

"It's kind of fun to do the impossible."

-Walt Disney

Today's Weather:

Clouds and some sun in the morning, then more clouds in the afternoon, high near 70°.

MATH 121

CHRIS BUTLER

SEARS 577

CHRIS @ CASE.EDU

216-368-2881

GRADES

50 QUIZZES $\times$ 4 = 200

3 TESTS + BEST = 400

FINAL = 200
800

NUMBERS

REAL

RATIONAL

IRRATIONAL

$$\frac{P}{Q}$$

ABSOLUTE VALUE

$$|a| = \begin{cases} a & a \geq 0 \\ -a & a < 0 \end{cases} \quad \leftarrow$$

$$\sqrt{a} \geq 0$$

$$\sqrt{a^2} = |a|$$

$$\sqrt{4^2} = 4$$

$$\sqrt{(-4)^2} = 4$$

INTERVALS

OPEN



$$a < x < b$$

CLOSED



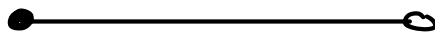
$$a \leq x \leq b$$

HALF-OPEN



$$a < x \leq b$$

HALF-CLOSE

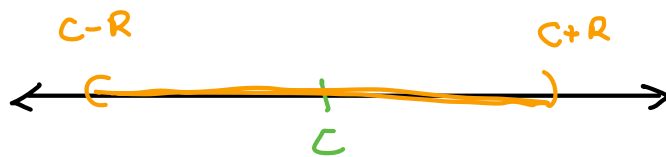


$$a \leq x < b$$

INEQ.

$$|x - c| < R$$

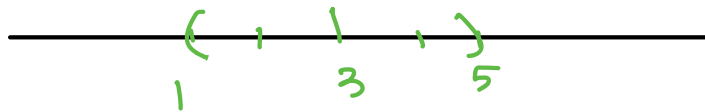
DISTANCE FROM x TO c IS LESS
THAN R



$$|x - c| < R \Leftrightarrow c - R < x < c + R$$

EXAMPLE

$$|x - 3| < 2$$



$$|x - 3| < 2$$

$$-2 < x - 3 < 2$$

$$1 < x < 5$$

DISTANCE FORMULA

(x_1, y_1)

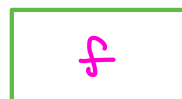
(x_2, y_2)

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

FUNCTIONS

$$y = f(x)$$

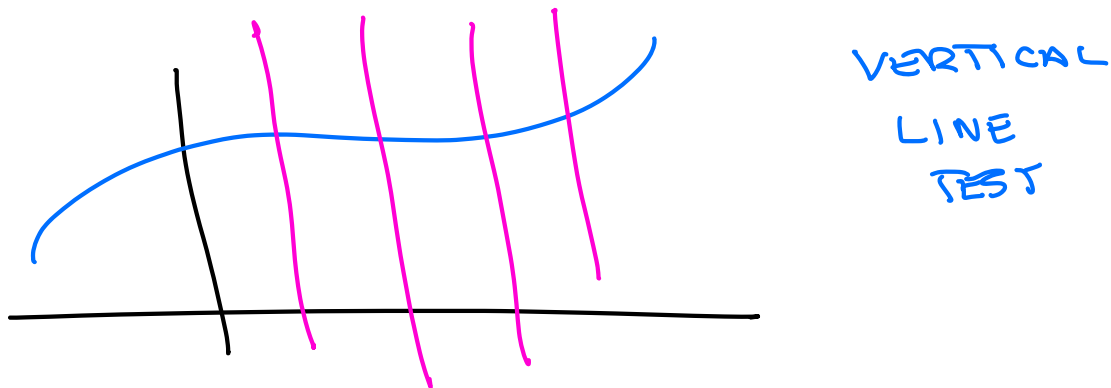
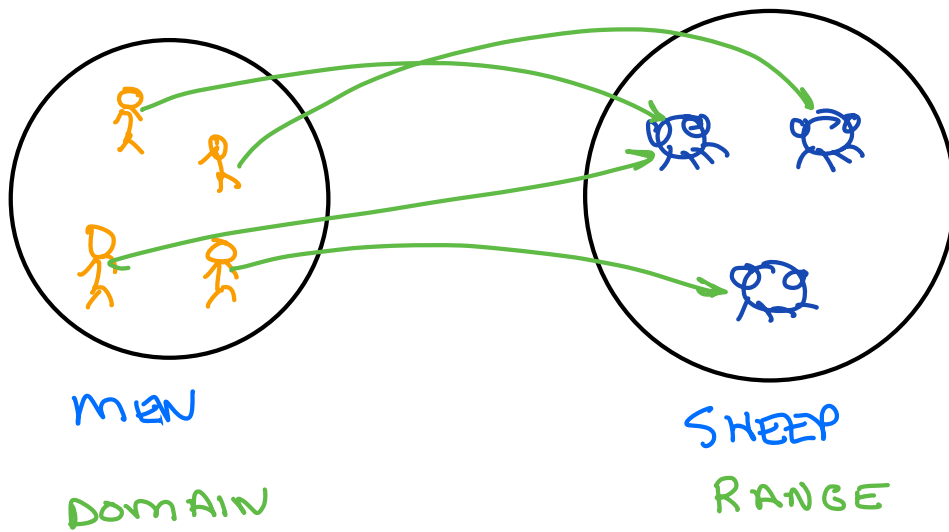
$x \longrightarrow$



$\longrightarrow$

y

ONE
OUTPUT



NATURAL DOMAIN

$$f(x) = \frac{1}{x-1} \quad x \neq 1$$

$$f(x) = \sqrt{x+2}$$

$$x+2 \geq 0$$

$$x \geq -2$$

LINES

$$y = mx + b$$

$$m \text{ IS SLOPE} = \frac{\text{RISE}}{\text{RUN}} = \frac{\Delta y}{\Delta x}$$

b IS y-INT HITS y-AXIS

$$y - y_1 = m(x - x_1)$$

$$Ax + By = C$$

QUADRATICS

$$y = ax^2 + bx + c$$

Roots / $ax^2 + bx + c = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

COMPLETING THE SQUARE.