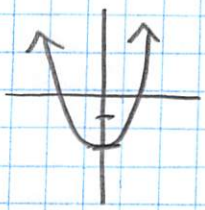
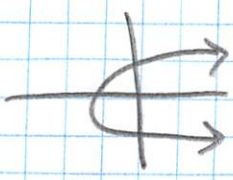
Lesson 1.1 : Day 1

Function denoted $f(x)$ or $g(x)$

- for each input, one output
- for each x-value, one y-value



Function



Not a function

#1 **Domain** set of all x values

$x \in \mathbb{R}$

Range set of all y-values

$y \in [-2, \infty)$

↑ bracket: value is included

↖ parenthesis: value is not included

#2 Airtanker flies over fire & drops water at a constant rate of 400 gal/s and tank holds 8,000 gallons

$y = 400x$

$8000 = 400x$

$20 = x$

Domain: $x \in [0, 20]$ ← what does this mean?

Range: $y \in [0, 8000]$

#3 Car tank modeled by $y = 20 - 0.05x$

y: gal in tank; x: # miles driven

- Find x & y intercepts

x-intercept ($y = 0$)

$0 = 20 - 0.05x$

$.05x = 20$

$x = 400$

car can drive 400 miles

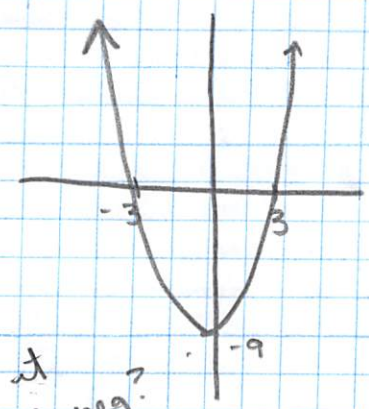
- y-intercept ($x = 0$)

$y = 20 - 0.05(0)$

$y = 20$

car holds 20 gallons

#4



what changes it from pos to neg?

$y = x^2 - 9$

find $f(x) > 0$ "when y is pos."

$f(x) < 0$ "when y is neg"

$f(x) > 0 \quad x \in (-\infty, -3) \cup (3, \infty)$

$f(x) < 0 \quad x \in (-3, \infty)$

#5 find when $y > 0$ $y < 0$

for $y = 2x + 10$

$0 = 2x + 10$

$-5 = x$

$y > 0 \quad x \in (-5, \infty)$

$y < 0 \quad x \in (-\infty, -5)$

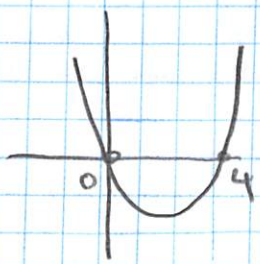
$f(x) = x^2 - 4x$

$f(x) = x(x-4)$

$0 = x \qquad x - 4 = 0$

$x = 4$

x-intercepts $(0,0)$ $(4,0)$



$f(x) > 0 \quad x \in (-\infty, 0) \cup (4, \infty)$

$f(x) < 0 \quad x \in (0, 4)$