

Review notes

• $\sqrt{2} \notin \mathbb{Q}$, $\pi \notin \mathbb{Q}$

• $[a, b)$ includes a ,
~~and~~ excludes b .

• What do they mean
in $[a, \infty)$, $(-\infty, b)$.

corrections!

• $\mathbb{N} \subset \mathbb{Z} \subset \mathbb{Q} \subset \mathbb{R}$

and what do they mean

• How to judge whether
a sequence is arithmetic,
geometric or neither.

What are a_1 , d , r ?

Formulas
for arithmetic

$$a_n = a_{n-1} + d$$

used to find d

$$a_n = a_1 + (n-1)d$$

used to predict a_n

$$\sum_{i=1}^n a_i = \frac{(a_1 + a_n) \cdot n}{2}$$

used to find the sum

Formulas
for geometric

$$a_n = a_{n-1} \cdot r$$

used to find r

$$a_n = a_1 \cdot r^{n-1}$$

used to ~~find~~ predict a_n

$$\sum_{i=1}^{\infty} a_i = \frac{a_1}{1-r}$$

used to find the sum

Implied domain is the set of numbers that let the
expression makes sense.

e.g. $f(x) = \frac{3x + x^3}{5}$, implied domain: \mathbb{R}

$f(x) = \frac{x+2}{2x-1}$, implied domain: $\mathbb{R} - \{\frac{1}{2}\}$

Caution: Implied domain is a set.

$\mathbb{R} - \{\frac{1}{2}\}$ ✓

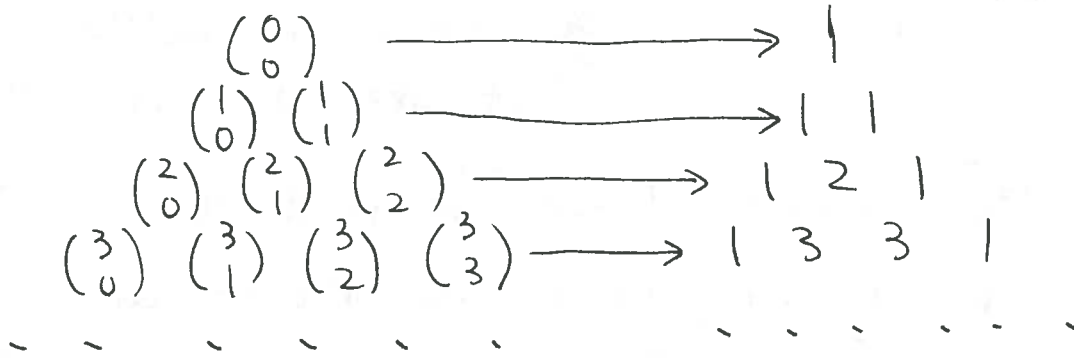
$x \neq \frac{1}{2}$ ✗

$\{\mathbb{R}\}$ ✗

Binomial theorem

$$\sum_{i=0}^n (x+y)^n = \sum_{i=0}^n \binom{n}{i} x^{n-i} y^i$$

Caution: Pascal triangle starts with $\binom{n}{0}$:



~~Order multiply~~

Option multiply

choose from m_1 , then m_2, \dots , finally m_k altogether $m_1 \cdot m_2 \cdot \dots \cdot m_k$ choices

- order k objects: $k!$
 - choose k from n without order: $\binom{n}{k}$
 - choose k from n and order: $\frac{n!}{(n-k)!}$
- $$\binom{n}{k} = \frac{n!}{(n-k)! k!}$$

- How to graph x^2, x^3, x^n (n even), x^n (n odd), id, $\frac{1}{x}, \frac{1}{x^2}, \frac{1}{x^n}$ (n even), $\frac{1}{x^n}$ (n odd) constant.

- Graph transformations

Caution: Watch out for the domain! (e.g. $f: \{0,1\} \rightarrow \mathbb{R}, f(x)=x+1$)

- How to use "o", "•",
- What are x-intercepts, y-intercepts, vertical line test

