## Math 6: Half 2 Review

## 1) Sequences

Arithmetic: $a_{n}=a_{1}+(n-1) * \mathrm{~d}$
Arithmetic mean: $a_{n}=\frac{a_{n-1}+a_{n+1}}{2}$
Geometric: $\mathrm{b}_{\mathrm{n}}=\mathrm{b}_{1} * \mathrm{q}^{\mathrm{n}-1}$
Geometric mean: $b_{n}=\sqrt{b_{n-1} \cdot b_{n+1}}$
2) Ruler and compass (take a ruler and compass with you)
-congruence
-midpoint, perpendicular bisector - angular bisector

## 3) Coordinate geometry

Straight line equation: $y=m x+b, m-$ slope, $b-y$-intercept
Distance between two points: $\quad d=\sqrt{\left(x_{2}-x_{1}\right)^{2}+\left(y_{2}-y_{1}\right)^{2}}$
Circle equation: $(x-a)^{2}+(y-b)^{2}=r^{2}$, of radius $r$ and center with coordinates $(a, b)$. vertical translation of function: $f(x) \rightarrow f(x)+c$.
horizontal translation of function: $f(x) \rightarrow f(x+c)$
4) Identities $(a+b)^{2}=a^{2}+2 a b+b^{2}$

$$
\begin{aligned}
& (a-b)^{2}=a^{2}-2 a b+b^{2} \\
& (a+b)(a-b)=a^{2}-b^{2}
\end{aligned}
$$

## 5) Equation systems

- substitution method
- elimination method


## 6) Inequalities

$$
\begin{aligned}
& a<b \Leftrightarrow(-a)>(-b) \\
& a b>0 \Leftrightarrow(a>0 \text { AND } b>0) \quad \text { OR } \quad(a<0 \text { AND } b<0) \\
& a b<0 \Leftrightarrow(a>0 \text { AND } b<0) \quad \text { OR } \quad(a<0 \text { AND } b>0)
\end{aligned}
$$

7) Odd, even, invariants

Odd + even $=$ odd etc.

