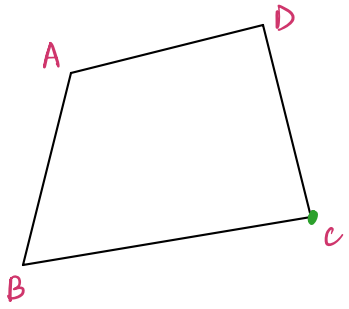
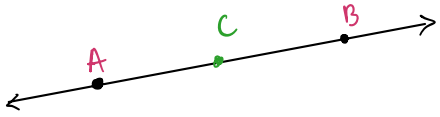
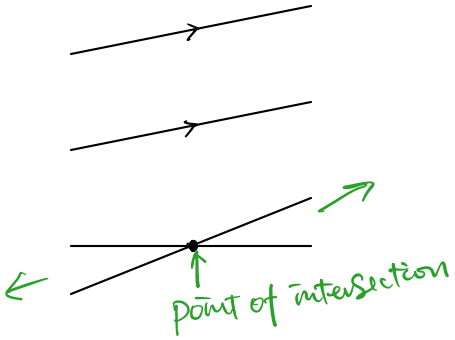
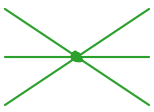
2A: Points & Lines







Terminologies:

- Point : somewhere in space Point C
  - ↳ Vertex Vertices
- [AB] • Line segment : can calculate the length.
- [A,B) • Ray : and beyond Ray AB
- (AB) • Line Line AB
- Colinear A, B, and C are colinear
- Concurrent  These lines are concurrent
- Parallel Two lines have the same distance to each other. They will never meet!
- Intersecting lines meet somewhere in space
  - ⇒ Point of intersection

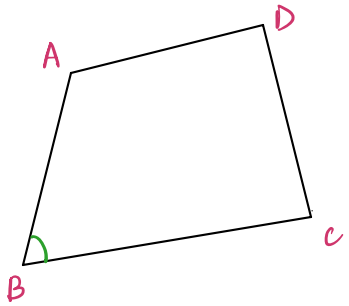
A _____ B

⇐

⇒

═══

2B Measuring angles

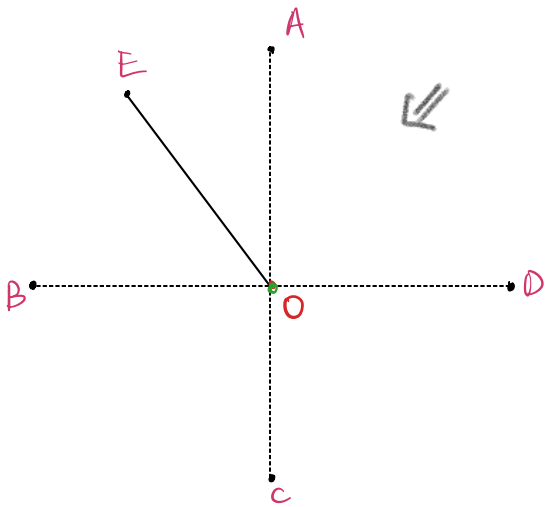


Terminologies:

- Three point notation

  $\hat{ABC}$ means the angle at B

∘ Revolution	360°	$A\hat{O}A$
∘ Straight angle	180°	$B\hat{O}D$
∘ Right angle	90°	$B\hat{O}C$
∘ Acute angle	$<90°$	$E\hat{O}B$
∘ Obtuse angle	$>90°$ $<180°$	$E\hat{O}D$
∘ Reflex angle	$>180°$ $<360°$	$C\hat{O}B$
∘ Degree	$0 - 360°$	
* Radian	$0 - 2\pi$	



2C Angle properties

- 360°

  Angles at a point ++ ⇒ 360°

- 180° at a line ++ ⇒ 180°

  ⇒ Supplementry ($A\hat{O}D$, $D\hat{O}C$)

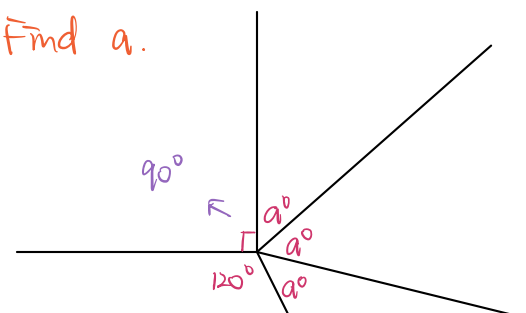
  ($A\hat{O}E$, $E\hat{O}C$)

- 90°

  ⇒ Complementry ($A\hat{O}E$, $E\hat{O}B$)

Example:

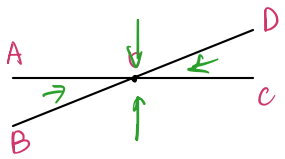
1. What angle size is the supplement of 48°? 132°
2. What angle size is the complement of 48°? 42°
3. Find a.



$3a° + 120° + 90° = 360°$

$3a° = 150°$ ⇒ $a = 50$

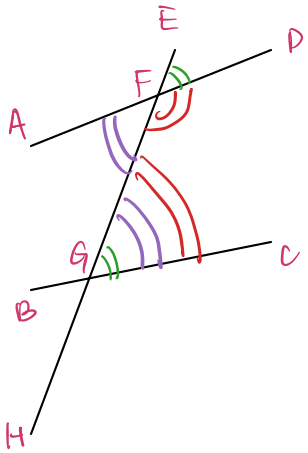
2E Angle pairs



Terminologies:

- Vertically opposite angles

  ($\hat{COD}$, $\hat{AOB}$)



- Transversal (EH)
- Angle pairs:
  - Corresponding (same position)

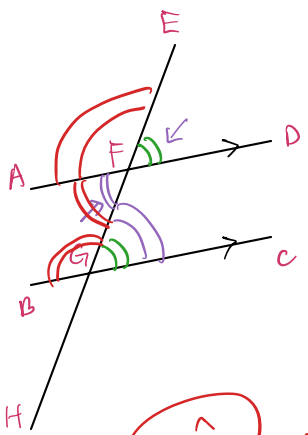
    $\hat{EFA}$, $\hat{FGB}$
  - Alternate (opposite sides, between)

    EH AD, BC

    $\hat{BGF}$ $\hat{DFG}$
  - Co-interior (same side, between)

    EH

    $\hat{AFG}$ $\hat{BGF}$



- Angle pairs: PARALLEL CASE
  - Corresponding (same position)

    $\hat{EFD} = \hat{FGC}$ Equal

    opposite
  - Alternate (opposite sides, between)

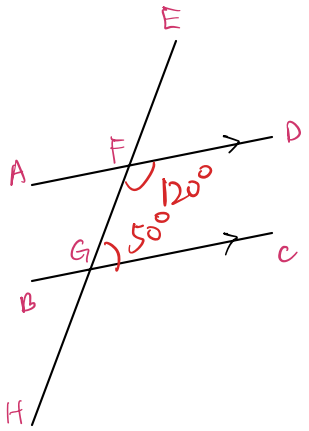
    Equal
  - Co-interior (same side, between)

    $\hat{AFG} + \hat{BGF} = 180°$

    Adds up to be 180°

$\hat{BGF} = \hat{AFE}$

Supplementary $\hat{AFE} + \hat{AFG} = 180°$



Example: 1. if $E\hat{F}D = 55°$, and $AD \parallel BC$.

Find $H\hat{G}C = 180° - 55° = 125°$

2. if $D\hat{F}G = 120°$ and $C\hat{G}F = 50°$,

⇒ Are AD and BC parallel lines? No

⇒ Are EH and AD perpendicular? No

Proof by contradiction:

Suppose AD // BC

↓

Find contradictions → $E\hat{F}D = 50°$, $E\hat{F}D = 60°$

↓

AD not parallel to BC

End-of-chapter assignments:

Page 53 Review Set 2A

Problem 3B, 6B, 6C, 9D, 10A

Page 55 Review Set 2B

Problem 5 8A, 8B