Math 105 TOPICS IN MATHEMATICS

REVIEW OF LECTURES – III (SUPPLEMENT)

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<div align="center">Appendix to §3.　Algebra refresher.</div>

- $\boxed{\textbf{Refresher \#1}}$

$$2 \ + \ 3 \ - \ 3 \ = \ ?$$
$$5 \ + \ 7 \ - \ 7 \ = \ ?$$
$$18 \ - \ 6 \ + \ 6 \ = \ ?$$
$$120 \ + \ 240 \ - \ 240 \ = \ ?$$

$\boxed{\textbf{Answers}}$

$$2 \ + \ 3 \ - \ 3 \ = \ 2.$$
$$5 \ + \ 7 \ - \ 7 \ = \ 5.$$
$$18 \ - \ 6 \ + \ 6 \ = \ 18.$$
$$120 \ + \ 240 \ - \ 240 \ = \ 120.$$

⋆　　More generally,

$$x \ + \ a \ - \ a \ = \ x.$$

⋆　　Sometimes, depending on a context, it is beneficial to

$$\underline{\underline{\text{rewrite}}} \quad \boxed{x} \quad \underline{\underline{\text{as}}} \quad \boxed{x \ + \ a \ - \ a} \ ,$$

with an appropriate a. We will see such an example in the main text.

<div align="center">1</div>

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$$2 \cdot 5 \;+\; 2 \cdot 3 \;\;=\;\; 2\left(5 + 3\right).$$

$$2 \cdot 1 \;+\; 2 \cdot 6 \;+\; 2 \cdot 9 \;\;=\;\; 2\left(1 + 6 + 9\right).$$

$$2 \cdot 2 \;+\; 2 \cdot 7 \;+\; 2 \cdot 5 \;+\; 2 \cdot 4 \;\;=\;\; 2\left(2 + 7 + 5 + 4\right).$$

More generally:

$$2\,a \;+\; 2\,b \;\;=\;\; 2\left(a + b\right),$$

$$2\,a \;+\; 2\,b \;+\; 2\,c \;\;=\;\; 2\left(a + b + c\right),$$

$$2\,a \;+\; 2\,b \;+\; 2\,c \;+\; 2\,d \;\;=\;\; 2\left(a + b + c + d\right),$$

$$\vdots$$

- **Refresher #3**   Solve the equation $\boxed{\; x \;=\; 360 \;-\; 2\,x \;}$.

$\boxed{\text{Solution}}$:   Drag the term $2x$ to the other side.

$$x \;\;=\;\; 360 \;-\; \boxed{2\ x}$$

$\Longrightarrow \qquad \boxed{2\ x} \;+\; x \;\;=\;\; 360$

$$\underbrace{}$$
$$\|$$
$$3\,x$$

$\Longrightarrow \qquad\qquad 3\,x \;\;=\;\; 360$

$\Longrightarrow \qquad\qquad x \;\;=\;\; \dfrac{360}{3} \;\;=\;\; 120.$

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