

NAME:

DATE:

Key

A2.Q2.BERMELLEEMBO: SIMPLIFY EXPRESSIONS + IMAGINARY NUMBER APPLICATION

DAY EP1

(EXPRESSIONS)

NOTES

PART I: Simplify each of the expressions.

$$\textcircled{1} \quad \textcircled{7}(3x) = \boxed{21x}$$

$$\textcircled{2} \quad \textcircled{8}(5-2x) = \boxed{40-16x}$$

$$\textcircled{3} \quad \textcircled{5x}(2+4x) = \boxed{10x+20x^2}$$

$$\textcircled{4} \quad \textcircled{3+6x}\textcircled{3-6x} = 9 - \cancel{18x} + \cancel{18x} - 36x^2 = \boxed{9-36x^2}$$

cancel

$$\textcircled{5} \quad \textcircled{7+3x}\textcircled{7-3x} = 49 - \cancel{21x} + \cancel{21x} - 9x^2 = \boxed{49-9x^2}$$

cancel

$$\textcircled{6} \quad \textcircled{5x+2}\textcircled{x-6} = 5x^2 - \boxed{30x} + \boxed{2x} - 12 = \boxed{5x^2-28x-12}$$

combine

*all different term types

$$\textcircled{7} \quad \textcircled{4x-3}\textcircled{x+2} = 4x^2 + \boxed{8x} - \boxed{3x} - 6 = \boxed{4x^2+5x-6}$$

combine

*all different term types

PART II: Simplify each of the expressions.

Convert "i" to a real number when applicable.

* Treat i like x

* Add cinnamon

$$i = \sqrt{-1} \text{ (imaginary)}$$

$$i^2 = -1 \text{ (real number)}$$

Cinnamon
Spice

$$\textcircled{1} \textcircled{7}(5i) = \boxed{35i} \text{ (imaginary)}$$

$$\textcircled{2} \textcircled{6}(4-3i) = \boxed{24-18i} \text{ (imaginary)}$$

$$\begin{aligned} \textcircled{3} \textcircled{5i}(2i+6) &= 10i^2 + 30i \\ &= 10(-1) + 30i \\ &= \boxed{-10+30i} \text{ (imaginary)} \end{aligned}$$

$$\begin{aligned} \textcircled{4} \textcircled{4i+2}(\textcircled{i+3}) &= 4i^2 + 12i + 2i + 6 \\ &= 4(-1) + 14i + 6 \\ &= \boxed{-4} + 14i \boxed{+6} \text{ combine like terms} \\ &= \boxed{2+14i} \text{ (imaginary)} \end{aligned}$$

$$\begin{aligned} \textcircled{5} \textcircled{10i-3}(\textcircled{i-2}) &= 10i^2 - 20i - 3i + 6 \\ &= 10(-1) - 23i + 6 \\ &= \boxed{-10} - 23i \boxed{+6} \text{ combine like terms} \\ &= \boxed{-4-23i} \text{ (imaginary)} \end{aligned}$$



$$\begin{aligned}
 \textcircled{6} \quad (7-2i)(7+2i) &= 49 + \cancel{14i} - \cancel{14i} - 4i^2 \\
 &= 49 - 4(-1) \\
 &= 49 + 4 \\
 &= \boxed{53} \text{ (real)}
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{7} \quad (4+12i)(4-12i) &= 16 - \cancel{48i} + \cancel{48i} - 144i^2 \\
 &= 16 - 144(-1) \\
 &= 16 + 144 \\
 &= \boxed{160} \text{ (real)}
 \end{aligned}$$