Unit 3: Relations, functions, and graphs
(With focus on linear functions and lines)

(Chapter 3, page 104)
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☐	Relation is set of ordered pairs. Domain: _____ Range: _____ ---- Examples:	Definition Page 107
☐	Set builder notation: $\{x \mid 2 < x < 8\} = \{3, 4, 5, 6, 7\}$	Page 108
☐	**Graph** Terms to know: ---- Cartesian coordinate system; Origin ; Quadrants ---- x-axis, y-axis ---- Coordinate of a point ---- x-coordinate, abscissa ; y-coordinate, ordinate	Page 110
☐	**Function** Relation in which each input has exactly one output. ---- Vertical line test	Page 117
☐	**One-to-One function** Function in which each output originated from exactly one input. ---- Horizontal line test	

(plot examples in the next table cell)

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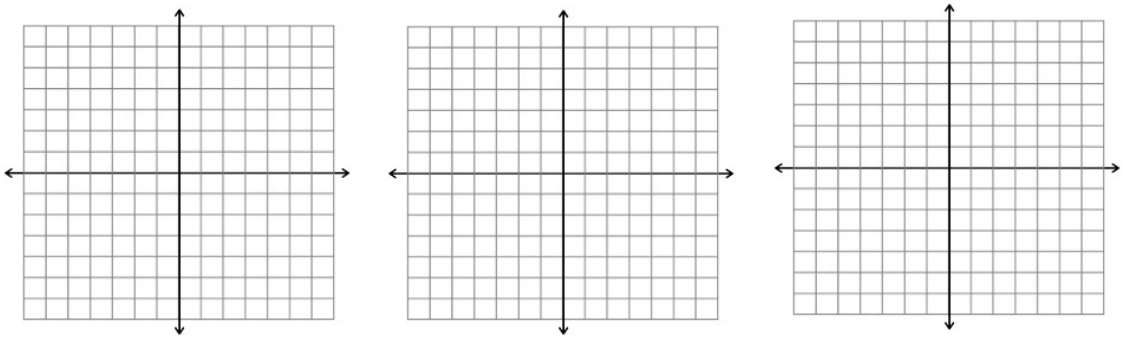
☐	Plot an example of a relation, a function, and one-to-one function. Relation Function One-to-one function  Domain: Range: Vertical line test: Horizontal line test:	
☐	Function composition $f(x) = x^2$; $g(x) = x + 2$ $f\big(g(x)\big) =$ _____ (Hint: $f(\blacksquare) = \blacksquare^2$, and $\blacksquare = x + 2$) $g\big(f(x)\big) =$ _____ Notation: $f\big(g(x)\big) = f \circ g$ ---- Example: Put an example of function composition	Definition Page 149

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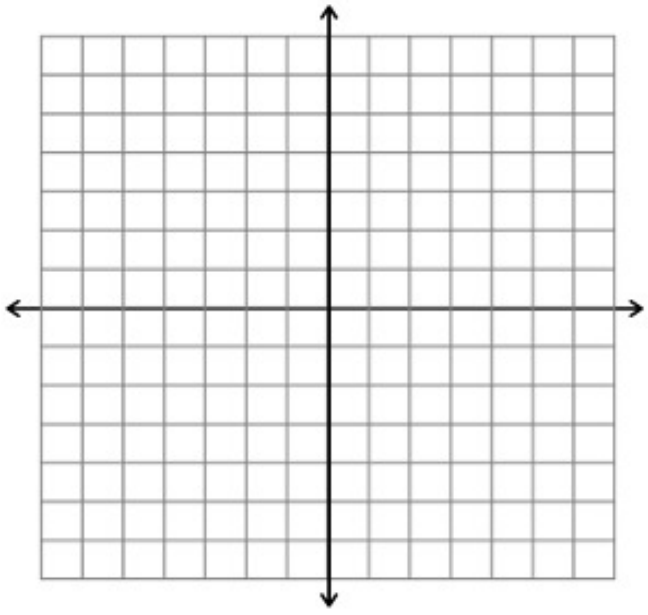
	Graphs of linear equations (line)	Page 122
☐	Linear equation (First degree equation) 1. No product of variables. 2. No variable has a power greater than 1. 3. No variable in the denominator.	Page 122
☐	The graph of linear equation is a line. ---- General line equation: $y = mx + b$ ---- x-intercept ; y-intercept ---- Slope of a line ---- Vertical line slope: ---- Horizontal line slope: ---- Line that goes through the origin ---- Parallel lines ---- Perpendicular lines ---- Positive slope, negative slope ---- Examples 	Theorem 3-1 Theorems 3-9 and 3-10

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	Lines	
☐	<u>Slope-intercept form</u> Useful for: <u>Point-slope form</u> Useful for: <u>Two-point form</u> Useful for: <u>Standard form</u> Useful for: ---- Examples: (transforming between the representation; when each is useful)	Theorem 3-7 Theorem 3-5 Theorem 3-6 Theorem 3-8

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