Handout for MATH 1300 (Barsamian) Lecture L21 Mon Oct 5, 2026 Sections 2.8, 3.1

Part 1: Variation (Section 2.8)

Definition of Direct and Indirect Variation

Words: y varies directly as x.

Alternate Words: y is directly proportional to x.

Meaning: There exists a nonzero constant real number k such that $y = kx$.

Words: y varies inversely as x.

Alternate Words: y is inversely proportional to x.

Meaning: There exists a nonzero constant real number k such that $y = \frac{k}{x}$.

[1] Write an equation that expresses the following relationship.
d varies directly with w and inversely with the square root of p.
In your equation, use k as the constant of proportionality.

[2] For each table, decide whether y is proportional to x or inversely proportional to x, or neither.
If proportional or inversely proportional, find k.

x	y
2	7
6	21
8	28

x	y
2	4
6	36
8	64

x	y
2	3
6	1
8	3/4

Part 2: Composition of functions (Sectionm 3.1)

[3] Suppose that the $p(x) = x^2 + 9$ and $q(x) = \sqrt{x+8}$
(a) Find $p \circ q(x)$ and $q \circ p(x)$. Give the domain and range of each function.
(b) Find $p \circ q(8)$ and $q \circ p(8)$

(More problems may be added here during class.)