

Honors Algebra II

Section 5.1

Model Inverse and Joint Variation

VOCABULARY

Inverse Variation: $y = a/x$ or _____ ; also a is not = to zero

Constant of Variation: a

Direct Variation: $y = ax$

Joint Variation: $z = axy$ or $w = axyz$

EXAMPLE 1 Tell whether x and y show direct variation, inverse variation or neither.

a) $xy = 7$ _____

b) $y = x + 3$ _____

c) $y / 4 = x$ _____

d) $y - 3x = 0$ _____

EXAMPLE 2 X and Y vary inversely, and $y = 7$ when $x = 4$. Write an equation that relates X and Y . Then find Y when $X = -2$.

EXAMPLE 3 The number of songs that can be stored on an MP3 player varies inversely with the average size of a song. A certain MP3 player can store 2500 songs when the average size of a song is 4 megabytes.

- a) Write a model that gives the number of n songs that will fit on the MP3 player as a function of the average song s (in megabytes).
- b) Make a table of values showing the number of songs that will fit on the MP3 player if the average size of a song is 2MB, 2.5MB, 3MB and 5 MB.

Average Song Size	2	2.5	3	5
Number of Songs				

- c) What happens to the number of songs as the average song size increases?

EXAMPLE 4 The table compares the area A (mm^2) of a computer chip with the number C of chips that can be obtained from a silicon wafer.

Area (mm^2), A	58	62	66	70
Number of chips, c	448	424	392	376

- a) Write a model that gives c as a function of A .

Steps

- 1) Find the product of each coordinate

- 2) a is approximately _____

Predict the number of chips/wafer when $A = 81\text{mm}^2$.

EXAMPLE 5 The variable z varies jointly with x and y . Also, $z = -75$ when $x = 3$ and $y = -5$. Write an equation that relates x , y and z . Then find z when $x = 2$ and $y = 6$.

EXAMPLE 6 Write an equation for the given relationship.

a) y varies inversely with x

b) z varies jointly with x , y & r

c) y varies inversely with the square of x

d) z varies directly with y and inversely with x

e) x varies jointly with t and r and inversely with s

f) x varies inversely with y and directly with w
