**8.1 Inverse Variation**.  
Objective: To recognize and use inverse variation  
To use joint and other variations

**Inverse Variation**: when two variables, x and y, are related as:

 (k ≠ 0) OR 

* y is said to vary inversely with x

**Constant of Variation** = k

*Examples:*

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

a)  d) 

b) y = x + 2 e) y = 1/x

c) xy = 4 f) ½ xy = 9

*The variables x and y vary inversely, and y = 8 when x = 3.*

*a) Write an equation that relates x and y.*

*b) Find y when x = - 4*

Variables x and y vary inversely, and y = 7.5 and x = 2. Find an equation that relates x and y, then find y when x = 1.2

**Joint Variation**: when a quantity varies directly as the product of two or more other quantities

[ex: z = kxy, where k ≠ 0, then z varies jointly with x and y]

**Comparing Different Types of Variation**;

|  |  |
| --- | --- |
| **Relationship** | **Equation** |
| *y varies directly with x* | y = kx |
| *y varies inversely with x* |  |
| ***z varies jointly with x and y*** | **z = kxy** |
| *y varies inversely with the square of x* |  |
| *z varies directly with y and inversely with x* |  |

*Examples:*

*Tell whether x varies jointly with y and z.*

a) x = 15yz b) xy = 4z

c)  d) 

*The variable z varies jointly with x and y. Use the given values to write an equation relating x, y, and z. Then find z when*

*x= -3 and y = 9.*

x = 3, y = 8, z = 6 x = , y = , z = - 2

*Write the equation for each of the following:*

a) y varies directly with x and inversely with z2

b) y varies inversely with x3

c) y varies directly with x2 and inversely with z

d) z varies jointly with x2 and y

e) y varies inversely with x and z

**HMWK: page 503 #1-5, 9-17 (odd), 23, 26-28**