

### 03. Nisbah, Kadar, Kadaran Dan Ubahan *Ratios, Rates, Proportion and Variation.*

Tingkatan Satu      Bab 4      : Nisbah, Kadar Dan Kadaran / *Ratios, Rates and Proportion.*  
 Tingkatan Lima      Bab 1      : Ubahan / *Variation*

#### NOTA RINGKAS



## UBAHAN/*VARIATION*

### UBAHAN LANGSUNG *DIRECT VARIATION*

y berkadar langsung dengan x.  
*y varies directly as x.*

$$y \propto x$$

### UBAHAN SONGSANG *INVERSE VARIATION*

y berkadar songsang dengan x.  
*y varies inversely as x.*

$$y \propto \frac{1}{x}$$

### UBAHAN TERCANTUM *JOINT VARIATION*

y berubah secara tercantum dengan  $x^m$  dan  $z^n$

*y varies jointly as  $x^m$  and  $z^n$*

$$y \propto x^m z^n$$

y berkadar langsung dengan q dan  $\sqrt{r}$ .  
*y varies directly as q and  $\sqrt{r}$ .*

$$y \propto q\sqrt{r}$$

### UBAHAN BERGABUNG *COMBINED VARIATION*

Melibatkan gabungan ubahan langsung atau tercantum dan ubahan songsang.

*Involves a combination of direct variation or joint variation and inverse variation.*

y berkadar langsung dengan  $x^m$  dan songsang dengan  $z^n$   
*y varies directly as  $x^m$  and inversely as  $z^n$*

$$y \propto \frac{x^m}{z^n}$$