

## Variance Analysis - Basic Formulas

### 1) Material, Labour, Variable Overhead Variances

Solve using the following:

(1)	AQ x AP
(2)	AQ x SP
(3)	SQ x SP
<b>2 - 1 =</b>	<b>Price Variance</b>
<b>3 - 2 =</b>	<b>Usage Variance</b>

AQ	Actual Quantity
AP	Actual Price
SP	Standard Price
SQ	Standard Quantity*

*\* Normally the toughest to calculate - what you "should have used" based on actual production*

*MF: Remember, Price + Usage Variance = **Total Variance***

### 2) Sales Variances

(1)	AQ x AP
(2)	AQ x SP
(3)	AQ x SC
(4)	SQ x SC
<b>1 - 2 =</b>	<b>Sales Price Variance</b>
<b>3 - 4 =</b>	<b>Sales Volume Variance</b>

AQ	Actual Sales Quantity
AP	Actual Sales Price
SP	Budgeted Sales Price

SQ	Standard Quantity ( <i>what you should have sold i.e. budget sales volume</i> )
SC	Standard Contribution ( <i>can also be budget gross profit per unit</i> )

### 3) Fixed Overhead Variances

#### a) In a Marginal Costing System: *(only one variance)*

(1)	Expenditure Variance:	Budget Expenditure - Actual Expenditure
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#### b) In an Absorption Costing System: *(two variances)*

(1)	Expenditure Variance:	Budget Expenditure - Actual Expenditure
(2)	Volume Variance:	(Standard - Budget) x OAR

OAR: Overhead Absorption Rate

Standard: The quantity you absorbed based on actual production\*

*\* Quantity could be units/machine hours/labour hours*

#### c) In an Absorption Costing System using labour hours *(two or four variances)*

(1)	Expenditure Variance:	Budget Expenditure - Actual Expenditure
(2)	Volume Variance:	(Standard - Budget) x OAR
<i>The volume variance can be broken down into Capacity and Efficiency variances:</i>		
(3)	Capacity Variance:	(Actual - Budget) x OAR
(4)	Efficiency Variance:	(Standard - Actual) x OAR

OAR: Overhead Absorption Rate

Standard: The quantity you absorbed based on actual production

*MF: How to tie in Volume, Capacity and Efficiency:*

$$\begin{array}{lcl}
 \text{Volume} & = & \text{Capacity} \\
 \text{Variance} & & \text{Variance} + \text{Efficiency} \\
 & & \text{Variance} \\
 \\ 
 \frac{\text{Standard}}{\text{Budget}} & = & \frac{\text{Actual}}{\text{Budget}} \times \frac{\text{Standard}}{\text{Actual}}
 \end{array}$$

#### 4) Mix and Yield Variances

*The sales volume and materials/labour usage variances can be broken down into mix and yield variances if more than one type of product is being sold or more than one type of material/labour is being used:*

(Q1)	(Q2)	(Q3)
Actual Quantity in Actual Proportions	Actual Quantity in Standard Proportions	Standard Quantity in Standard Proportions
<b>(Q2 - Q1) x Standard* = Mix Variance</b>		
<b>(Q3 - Q2) x Standard* = Yield Variance</b>		
<i>Standard* = standard cost/standard rate/standard contribution depending on whether you are looking at materials/labour/sales</i>		

*MF:*

*Q1 is normally given in the question i.e. actual quantity used broken down by actual proportions*

*Q2 is the actual quantity used broken down by standard ("normal") proportions*

*Q3 is the tricky one, calculated as follows: In relation to your actual output, what standard ("normal") quantity would you expect to use to achieve it?*