15-39 Overhead: Four-Variance Analysis

Fixed overhead application rate: $18,000 ÷ 4,500 = $4.00/DLH

Actual fixed overhead: $40,000 – $24,150 = $15,850;

Actual variable OH rate/DLH = $24,150/4,200DLHs = $5.75/DLH

	Actual (AQ x AP)	**Flexible Budget Based on *Inputs* (AQ x SP)**	**Flexible Budget Based on *Outputs* (SQ x SP)**	**Standard Cost Applied to Production (SQ x SP)**
Variable Overhead	(4,200 x $5.75) = **$24,150**	(4,200 x $5.00) = **$21,000**	(4,000 x $5.00) = **$20,000**	(4,000 x $5.00) = $20,000

Spending Efficiency N/A

Variance = **$3,150U** Variance = **$1,000U**

	Actual	**Lump-sum Amount**	**Lump-Sum Amount**	**Applied (SQ x SP)**
Fixed Overhead	**$15,850**	**$18,000**	**$18,000**	(4,000 x $4.00) = **$16,000**

Spending N/A Production-Volume

Variance = **$2,150F** Variance = **$2,000U**

Total Overhead	**$40,000**	(4,000 x $9.00) **$36,000**

Total Overhead Variance = $4,000U (from a product-costing standpoint this is referred to as total *under*applied overhead of $4,000)

Four-Variance Decomposition of Total Overhead Variance for December:

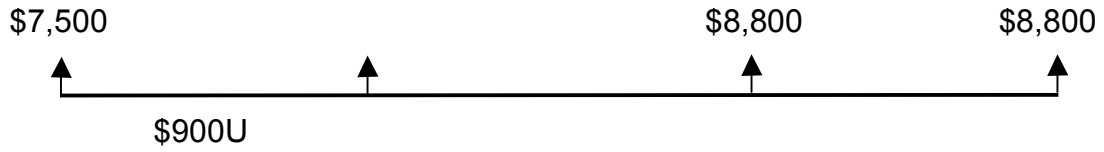
(1) Variable Overhead Spending Variance	=	$3,150U
(2) Variable Overhead Efficiency Variance	=	$1,000U
(3) Fixed Overhead Spending Variance	=	$2,150F
(4) Production Volume Variance	=	$2,000U
Total Overhead Variance	=	**$4,000U**

Handout problem

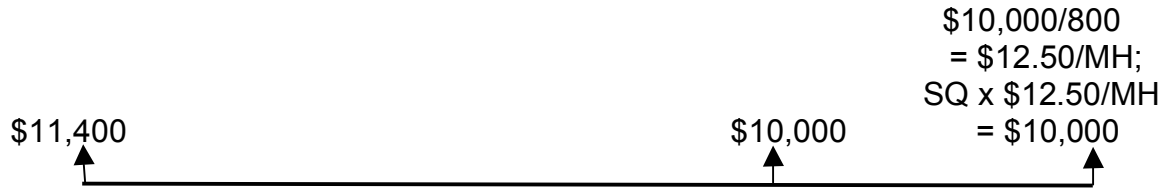
Find the Unknowns, Four-Variance Analysis (

	Case 1	Case 2	Case 3
Actual Operating Level and Costs Incurred			
Actual machine-hours worked	A 600	K 600	U 1,280
Variable factory overhead incurred	$7,500	L $3,960	W $6,850
Fixed factory overhead incurred	$11,400	M $7,200	$11,500
FB Based on Output (allowed machine hours)			
Budgeted variable factory overhead	B $8,800	N $3,960	X $6,200
Budgeted fixed factory overhead	$10,000	O $8,000	$16,500
Total budgeted factory overhead	C$18,800	$11,960	Y $22,700
Standard cost data			
Variable factory overhead rate per machine hour	D $11.00	$6.60	$5.00
Fixed factory overhead rate per machine hour	E $12.50	P $12.50	Z $13.75
Denominator level (in machine hours)	800	Q 640	1,200
Total standard machine hours for output achieved	F 800	600	AA 1,240
Total standard variable factory overhead applied	$8,800	R $3,960	BB $6,200
Total standard variable overhead for the actual MH	G $6,600	S $3,960	CC $6,400
Total standard fixed factory overhead applied	$10,000	T $7,500	DD $17,050
Factory Overhead Variances			
Variable factory overhead spending variance	$900U	$0	$450U
Variable factory overhead efficiency variance	H $2,200F	$0	$200U
Fixed factory overhead spending variance	I $1,400U	$800F	EE $5,000F
Fixed factory overhead production volume variance	J $0	$500U	$550F

Case 1: Overhead Variance Summary



Fixed overhead



Handout problem

(B) (Flexible) budget for variable factory overhead = Total standard variable overhead applied = **$8,800**

(C) Total (flexible) budget for factory overhead = $8,800 + $10,000 = **$18,800**

(G) Total variable overhead at actual MH = $7,500 – $900 = **$6,600**

(E) Fixed overhead rate per MH = $10,000 ÷ 800 = **$12.50**

(H) Variable overhead efficiency variance = $6,600 – $8,800 = **$2,200F**

(F) Total standard MH for the units manufactured = $10,000 ÷ $12.50 = **800**

(D) Standard variable overhead rate/MH = $8,800 ÷ 800 = **$11.00**

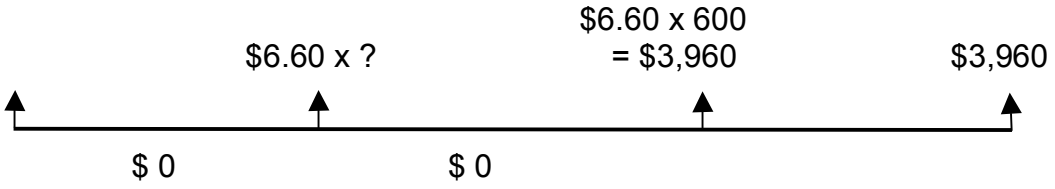
(A) Actual MH spent = $6,600 (G) ÷ $11 (D) = **600**

(I) Fixed overhead spending variance = $11,400 – $10,000 = **$1,400U**

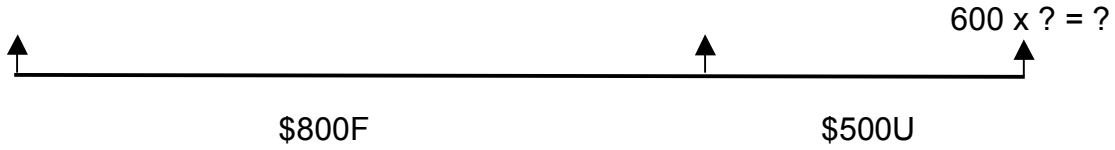
(J) Production volume variance = $10,000 (Budgeted) – $10,000 (Applied) = **$0**

<u>Case 2: Overhead Variance Summary</u>

Variable overhead



Fixed overhead



(K) Actual machine-hours spent (same as total standard hours) = **600**

(N) Flexible (control) budget variable overhead = $6.60 x 600 = **$3,960**

(R) Total standard variable overhead applied = (N) = **$3,960**

(L) Actual variable overhead cost incurred (in this case, same as total standard variable cost applied to production) = **$3,960**

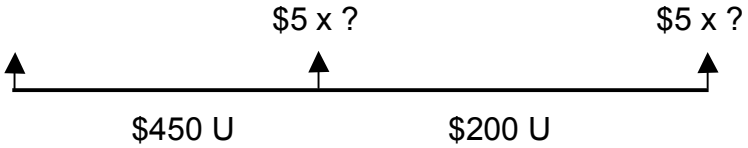
(S) Total variable overhead for the actual MH worked (in this case, same as total standard variable cost applied to production) = **$3,960**

Handout problem

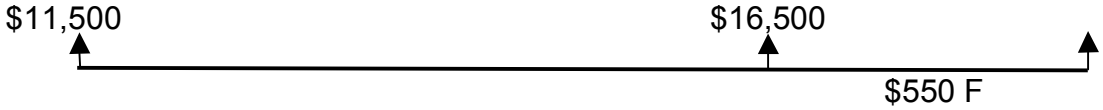
(O)Total budgeted fixed overhead = $11,960 – $3,960 (N)	=	**$8,000**
(T) Total fixed overhead applied = $8,000 (O) – $500	=	**$7,500**
(P) Standard fixed overhead rate = $7,500 (T) ÷ 600	=	**$12.50**
(Q) Denominator level = $8,000 (O) ÷ $12.50 (P)	=	**640**
(M) Fixed factory overhead incurred = $8,000 (O) – $800	=	**$7,200**

<u>Case 3: Overhead Variance Summary</u>

Variable overhead



Fixed overhead



(Z) Standard fixed overhead rate =	$16,500 ÷ 1,200 =	**$13.75**
(DD) Total fixed overhead applied =	$16,500 + $550 =	**$17,050**
(AA) Total standard machine-hours allowed for the output achieved =	$17,050 (DD) ÷ $13.75 (Z) =	**1,240**
(BB)Total standard VOH applied =	$5 x 1,240 (AA) =	**$6,200**
(X) Flexible-budget for variable overhead = (BB)	=	**$6,200**
(CC) Total variable overhead for the actual MH worked =	$6,200 (X) + $200 =	**$6,400**
(U) Actual machine-hours spent =	$6,400 (CC) ÷ $5.00 =	**1,280**
(W) Actual variable overhead incurred =	$6,400 (CC) + $450 =	**$6,850**
(Y)Total budgeted factory overhead =	$6,200 (X) + $16,500 =	**$22,700**
(EE) Fixed factory overhead spending variance =	$11,500 – $16,500 =	**$5,000F**