M13.1.

Total manufacturing cost = (Direct materials + Direct labor + Manufacturing overhead)

Direct materials …….…….		$ 18,000
Direct labor……..……		26,000
Manufacturing overhead:		
Factory supplies……..……	$ 2,500	
Plant depreciation……	6,200	
Indirect labor……...…	8,000	
Utilities……	7,500	24,200
Total manufacturing cost……		**$68,200**

M13.2.

Predetermined overhead application rate
= ($1,200,000 estimated total overhead cost / 400,000 estimated machine hours)
= **$3.00 per machine hour**

Total cost for 1,000,000 units produced:

Raw materials ……	$1,280,000
Direct labor ……	1,620,000
Overhead (420,000 machine hours * $3.00 predetermined rate) ……...	1,260,000
Total manufacturing cost……	$4,160,000

Cost per unit = ($4,160,000 total cost / 1,000,000 units produced)
= **$4.16 per unit.**

E13.15.

a. Predetermined overhead application rate
= ($408,750 estimated total overhead cost / 54,500 estimated direct labor hours)
= **$7.50 per direct labor hour**

b. ***Total cost for 750 coffee mugs produced:***

Raw materials ……	$ 810
Direct labor (90 direct labor hours * $9.50 per hour) ……	855
Overhead (90 direct labor hours * $7.50 predetermined rate)……	675
Total manufacturing cost...…….	$ 2,340

Cost per coffee mug produced = ($2,340 total cost / 750 mugs)
= **$3.12 per coffee mug**

c. Cost of coffee mugs sold = (530 mugs * $3.12 per mug) = **$1,653.60**
Cost of coffee mugs in inventory = (220 mugs * $3.12 per mug) = **$686.40**

P13.29.

a. *Note:* This problem does not require a formal statement of cost of goods manufactured; the requirements can be solved using a "T" account approach.

Raw materials:		
Inventory, Sept. 30 ……	$ 33,500	
Purchases during October …….	123,900	
Raw materials available for use ……	157,400	
Less: Inventory, Oct. 31……	(27,600)	
Cost of raw materials used……		$129,800
Direct labor cost incurred……		312,200
Manufacturing overhead applied ……		192,300
Total manufacturing costs, October ……		$634,300
Add: Work-in-process, Sept. 30 …….		71,300
Less: Work-in-process, Oct. 31 …….		(64,800)
Cost of goods manufactured, October ……		**$640,800**

b.

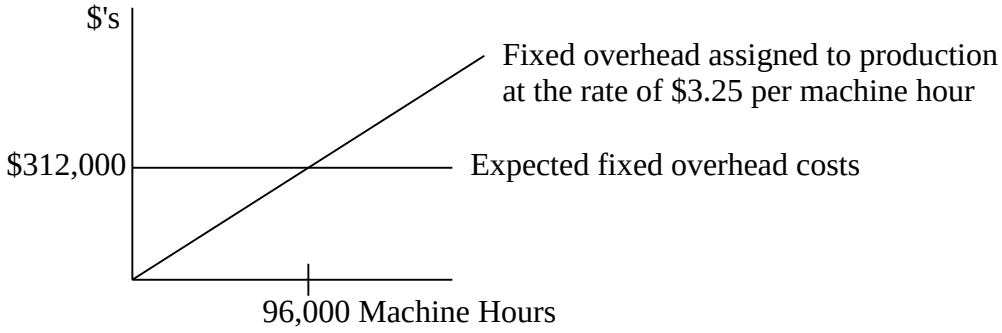
Finished goods, Sept. 30 ……	$ 47,200
Cost of goods manufactured……	640,800
Cost of goods available for sale …….	$688,000
Less: Finished goods, Oct. 31 ……	(41,900)
Cost of goods sold …….	**$646,100**

C13.32.

a. Predetermined fixed manufacturing overhead application rate
= $312,000 / 96,000 machine hours = **$3.25 per machine hour**

The predetermined overhead rate will be used to apply fixed manufacturing overhead to each unit produced during the year at the rate of $3.25 for each machine hour incurred.

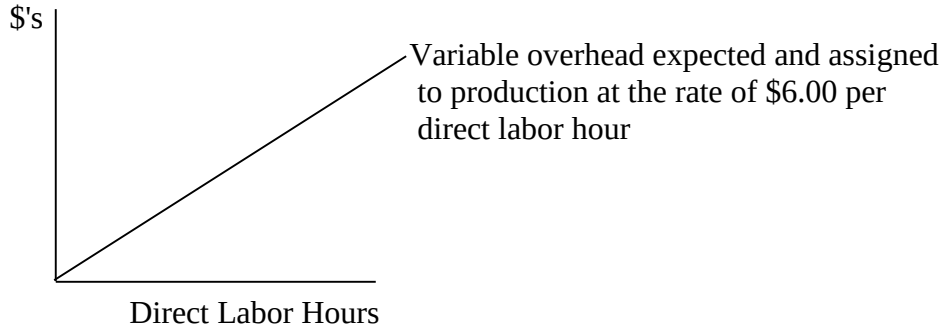
b. Graph of fixed manufacturing overhead relationships:



The graph illustrates that fixed overhead costs are treated differently for planning and control purposes than for product costing purposes. For planning purposes, fixed costs are expected to total $312,000, but for product costing purposes fixed costs are unitized over some level of activity in order to allow each unit produced to absorb a share of the total fixed costs. Note that only if Custom Granite generates exactly 96,000 machine hours will the units produced exactly absorb total fixed costs of $312,000. Also notice that overhead costs are expected to be incurred even if zero machine hours are used (i.e., no production).

(continued)

Graph of variable manufacturing overhead relationships:



The graph illustrates that variable overhead costs are treated similarly for planning and control purposes and for product costing purposes. Variable overhead costs are expected to be incurred at the rate of $6.00 per direct labor hour and they will also be assigned to each unit produced at the rate of $6.00 per direct labor hour.

Raw Materials Inventory

BI	39,000		
Purchases	240,000	?	Raw materials used during the year
EI	27,000		

Solving for the missing amount, raw materials used = **$252,000**

Raw material purchases and usage will differ by the amount of change in the inventory of raw material. Materials purchased in addition to any beginning inventory of raw material will represent the raw material available for use. The amount of raw materials used is determined by subtracting any ending inventory of raw material from the raw material available for use.

Direct labor hours worked during the year
= ($480,000 direct labor costs incurred / $16.00 per hour direct labor rate)
= 30,000 direct labor hours

Variable manufacturing overhead applied to work in process
= (30,000 direct labor hours * $6 per hour) = **$180,000**

C13.32. ***(continued)***

e. Yes, the applied amount of variable overhead for the year could differ from the actual amount incurred for several reasons. The cost category of variable overhead is comprised of many individual cost items such as indirect materials, some indirect labor, electricity, shop supplies, etc. The variable overhead rate of $6.00 per direct labor hour was based on an expectation of using a certain amount of each variable overhead item per direct labor hour and paying a certain amount to acquire each variable overhead item. It is possible that more or less of any variable overhead item could be used during the year compared to the quantity planned and it is also possible that Custom Granite could have paid more or less to acquire any particular variable overhead item. It is also likely that the items comprising variable overhead are not as directly associated with the use of direct labor as the overhead rate implies.

f. Fixed manufacturing overhead applied to work in process
= (88,000 machine hours * $3.25 per hour) = **$286,000**

Yes, the amount of fixed overhead applied to work in process during the year could be different from the amount actually incurred for two reasons. The cost category of fixed overhead is comprised of many individual cost items such as supervisor salaries, depreciation, property taxes, maintenance, etc. It is possible that Custom Granite could have paid more or less to acquire any particular fixed overhead item during the year. In addition, Custom Granite planned to spread fixed overhead to the units produced based on working 96,000 machine hours, and if the company incurs more or less than 96,000 machines hours, too much or too little fixed overhead will be applied to work in process.

g. ***Analysis of the Work in Process Inventory account:***

Beginning balance ……	$ 33,000
Add: Raw materials used ……..……	252,000
Direct labor ……..……	480,000
Fixed manufacturing overhead applied…..……	286,000
Variable manufacturing overhead applied……	180,000
Total manufacturing costs ……..……	1,231,000
Less: Cost of goods manufactured ……	**(?)**
Ending balance ……..……	$ 51,500

Solving for the missing amount, cost of goods manufactured = **$1,179,500**

h. ***Analysis of the Finished Goods Inventory account:***

Beginning balance	$ 104,000
Add: Cost of goods manufactured	1,179,500

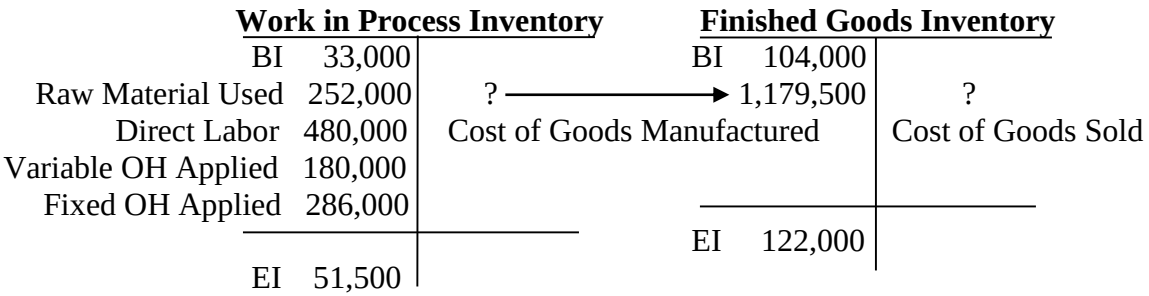
Less: Cost of goods sold	**(?)**
Ending balance	$ 122,000

Solving for the missing amount, cost of goods sold = **$1,161,500**

The cost of goods manufactured and *not sold* is represented by the ending balance of the finished goods inventory = **$122,000**

C13.32. (continued)

h. ***"T" accounts for requirements (g) and (h):***



i. Observing the graph in requirement (b) illustrates that when Custom Granite generates less than 96,000 machine hours, it will not apply the $312,000 amount of expected fixed overhead for the year. Conversely, if Custom Granite generates more that 96,000 machine hours it will apply more than the $312,000 expected fixed overhead for the year. By generating 8,000 less machine hours than planned, Custom Granite underapplied fixed overhead costs in the amount of (8,000 MH x $3.25/MH) $26,000 to the units produced. Therefore, work in process and finished goods inventories would be understated on the balance sheet and cost of goods sold would be understated on the income statement.