Chapter 8 Inventories: Measurement

QUESTIONS FOR REVIEW OF KEY TOPICS

Question 8–1

Inventory for a manufacturing company consists of (1) raw materials, (2) work in process, and (3) finished goods. *Raw materials* represent the cost, primarily purchase price plus freight charges, of goods purchased from suppliers that will become part of the finished product. *Work-in-process* inventory represents the products that are not yet complete in the manufacturing process. The cost of work in process includes the cost of raw materials used in production, the cost of labor that can be directly traced to the goods in process, and an allocated portion of other manufacturing costs, called manufacturing overhead. When the manufacturing process is completed, these costs that have been accumulated in work in process are transferred to *finished goods*.

Question 8–2

Beginning inventory plus net purchases for the period equals cost of goods available for sale. The main difference between a perpetual and a periodic system is that the periodic system allocates cost of goods available for sale to ending inventory and cost of goods sold only at the end of the period. The perpetual system accomplishes this allocation by decreasing inventory and increasing cost of goods sold each time goods are sold.

The perpetual inventory system is used by nearly all major companies.

Question 8–3

	Perpetual System	Periodic System
(1) Purchase of merchandise	debit *inventory*	debit *purchases*
(2) Sale of merchandise	debit *cost of goods sold*; credit *inventory*	no entry
(3) Return of merchandise	credit *inventory*	credit *purchase returns*
(4) Payment of freight	debit *inventory*	debit *freight-in*

Question 8–4

Inventory shipped f.o.b. shipping point is included in the inventory of the purchaser when the merchandise is given to the delivery company. Depot Corporation records the purchase in 2024 and includes the shipment in its ending inventory. Boxcar Company records the sale in 2024. Inventory shipped f.o.b. destination is included in the inventory of the seller until it reaches the purchaser's location. Boxcar would include the merchandise in its 2024 ending inventory and the sale/purchase would be recorded in 2025.

Question 8–5

A consignment is an arrangement under which goods are physically transferred to another company (the consignee), but the transferor (consignor) retains legal title. If the consignee can't find a buyer, the goods are returned to the consignor. Goods held on consignment are included in the inventory of the consignor until sold by the consignee.

Question 8–6

Under the *gross method*, we record the purchase for the full (or gross) amount of the inventory's cost. Purchase discounts taken are a reduction of inventory at the time the invoice is paid. Under the *net method*, we record the purchase of inventory for its full amount minus (or net of) the possible discount on that amount. The presumption by the purchaser under the net method is that inventory should be recorded for its cost, and because the purchaser expects to pay the invoice within the discount period, the discount should be subtracted at the time of the purchase to reflect the inventory's expected cost.

Question 8–7

1. Beginning inventory — increase
2. Purchases — increase
3. Ending inventory — decrease
4. Purchase returns — decrease
5. Freight-in — increase

Answers to Questions (continued)

Question 8–8

Four methods of assigning cost to ending inventory and cost of goods sold are (1) specific identification, (2) first-in, first-out (FIFO), (3) last-in, first-out (LIFO), and (4) average cost. The specific identification method requires each unit sold during the period or each unit on hand at the end of the period to be traced through the system and matched with its actual cost. First-in, first-out (FIFO) assumes that units sold are the first units purchased. The last-in, first-out (LIFO) method assumes that the units sold are the most recent units purchased. The average cost method assumes that cost of goods sold and ending inventory consist of a mixture of all the goods available for sale. The average unit cost applied to goods sold or ending inventory is an average unit cost weighted by the number of units acquired at the various unit prices.

Question 8–9

When costs are *declining*, LIFO will result in a *lower* cost of goods sold and *higher* net income than FIFO. This is because LIFO will include in cost of goods sold the most recently purchased lower-cost merchandise. LIFO also will provide a *higher* ending inventory in the balance sheet when costs are declining because the inventory has units purchased at an earlier date, when costs were higher.

Question 8–10

Proponents of LIFO argue that it provides a better match of revenues and expenses because cost of goods sold includes the costs of the most recent purchases. These are matched with sales that reflect a current selling price. On the other hand, inventory costs in the balance sheet generally are out of date because they are derived from old purchase transactions. It is conceivable that a company's LIFO inventory balance could be based on unit costs actually incurred several years earlier. *When inventory quantity declines* during a period, then these out-of-date inventory layers will be liquidated and cost of goods sold will match noncurrent costs with current selling prices.

Answers to Questions (continued)

Question 8–11

Many companies choose the LIFO inventory method to reduce income taxes in periods when prices are rising. In periods of rising prices, LIFO results in a higher cost of goods sold and therefore a lower net income than the other methods. The companies' income tax returns will report lower taxable incomes using LIFO and lower taxes will be paid currently. If a company uses LIFO to measure its taxable income, IRS regulations require that LIFO also be used to measure income reported to investors and creditors.

Question 8–12

The gross profit, inventory turnover, and average days in inventory ratios are designed to monitor inventories. The gross profit ratio is calculated by dividing gross profit (net sales minus cost of goods sold) by net sales. Inventory turnover is calculated by dividing cost of goods sold by average inventory, and we compute average days in inventory by dividing the number of days in the period by the inventory turnover ratio.

Question 8–13

A LIFO inventory pool groups inventory units into pools based on physical similarities of the individual units. The average cost for all of a pool's beginning inventory and for all of a pool's purchases during the period is used instead of individual unit costs. If the quantity of ending inventory for the pool increases, then ending inventory will consist of the beginning inventory plus a layer added during the period at the average acquisition cost for the pool.

Question 8–14

The dollar-value LIFO method has important advantages. First, it simplifies the recordkeeping procedures compared to unit LIFO because no information is needed about unit flows. Second, it minimizes the probability of the liquidation of LIFO inventory layers, even more so than the use of pools alone, through the aggregation of many types of inventory into larger pools. In addition, firms that do not replace units sold with new units of the same kind can use the method.

Answers to Questions (concluded)

Question 8–15

After determining ending inventory at year-end cost, the following steps remain:

1. Convert ending inventory valued at year-end cost to base year cost.
2. Identify the layers in ending inventory with the years they were created.
3. Convert each layer's base year cost measurement to layer year cost measurement using the layer year's cost index and then sum the layers.

Question 8–16

The primary difference between U.S. GAAP and IFRS in the methods allowed to value inventory is that IFRS does not allow the use of the LIFO method.

BRIEF EXERCISES

Brief Exercise 8–1

Beginning inventory	$186,000
Plus: Purchases	945,000
Less: Cost of goods sold	(982,000)
Ending inventory	**$149,000**

Brief Exercise 8–2

To record the purchase of inventory on account.

Inventory	845,000	
Accounts payable		845,000

To record sales on account and cost of goods sold.

Accounts receivable	1,420,000	
Sales revenue..		1,420,000
Cost of goods sold...	902,000	
Inventory		902,000

Brief Exercise 8–3

To record the purchase of inventory on account.

Purchases	845,000	
Accounts payable...		845,000

To record sales on account.

Accounts receivable...	1,420,000	
Sales revenue		1,420,000

Brief Exercise 8–4

Both shipments should be included in inventory.
The goods shipped to a customer f.o.b. destination did not arrive at the customer's location until after the fiscal year-end. They belong to Kryoton until they arrive at the customer's location. Title to the goods shipped from a supplier to Kryoton on December 30, f.o.b. shipping point, changed hands on December 30.

Brief Exercise 8–5

$140,000 (= $200,000 − $60,000)

Brief Exercise 8–6

To record the purchase of inventory on account.

Inventory	100,000	
Accounts payable		100,000

To record freight-in.

Inventory	5,000	
Cash..		5,000

Brief Exercise 8–7

To record the purchase of inventory on account.

Purchases...	100,000	
Accounts payable		100,000

To record freight-in.

Freight-in...	5,000	
Cash..		5,000

Brief Exercise 8–8

To record the purchase of inventory on account.

Inventory..	250,000	
Accounts payable...		250,000

To record purchase return.

Accounts payable...	20,000	
Inventory..		20,000

Brief Exercise 8–9

To record the purchase of inventory on account.

Purchases	250,000	
Accounts payable...		250,000

To record purchase return.

Accounts payable...	20,000	
Purchase returns..		20,000

Brief Exercise 8–10

Purchase price $= 10 \text{ units} \times \$25,000 = \$250,000$

December 28, 2024

Inventory	250,000	
Accounts payable		250,000

January 6, 2025

Accounts payable	250,000	
Cash (99% × $250,000)...		247,500
Inventory (1% × $250,000)...		2,500

Brief Exercise 8–11

December 28, 2024
Inventory (99% × $250,000) 247,500
    Accounts payable   247,500

January 6, 2025
Accounts payable... 247,500
    Cash   247,500

Brief Exercise 8–12

First-in, first-out (FIFO)

Cost of goods sold:

Date of Sale	Units Sold	Cost of Units Sold	Total Cost
January 10	125 (from Beg. Inv.)	$25	$3,125
January 25	75 (from Beg. Inv.)	25	1,875
	25 (from 1/8 purchase)	28	700
Total	225		$5,700

Ending inventory:

Date of Purchase	Units	Unit Cost	Total Cost
January 8	75	$28	$2,100
January 19	200	30	6,000
Total			$8,100

Brief Exercise 8–12 (concluded)

Average cost

Date	Purchased	Sold	Balance		
Beginning inventory	200 @ $25 = $5,000		200 @ $25	$5,000	
January 8	100 @ $28 = $2,800				
Available	$\dfrac{\$7,800}{300 \text{ units}}$ = $26/unit				
January 10		125 @ $26 = $3,250	175 @ $26	$4,550	
January 19	200 @ $30 = $6,000				
Available	$\dfrac{\$10,550}{375 \text{ units}}$ = $28.133/unit				
January 25		100 @ $28.133 = $2,813	275 @ $28.133	**$7,737** *Ending inventory*	
	Total cost of goods sold	= **$6,063**			

Brief Exercise 8–13

Cost of goods available for sale:

Beginning inventory (200 × $25)		$ 5,000
Purchases:		
100 × $28	$2,800	
200 × $30	6,000	8,800
Cost of goods available (500 units)		$13,800

First-in, first-out (FIFO)

Cost of goods available for sale (500 units)	$13,800
Less: Ending inventory (determined below)	(8,100)
Cost of goods sold	$ 5,700

Cost of ending inventory:

Date of purchase	Units	Unit cost	Total cost
January 8	75	$28	$2,100
January 19	200	30	6,000
Total			$8,100

Average cost

Cost of goods available for sale (500 units)	$13,800
Less: Ending inventory (determined below)	(7,590)
Cost of goods sold	$ 6,210 *

Cost of ending inventory:

$$\text{Weighted-average unit cost} = \frac{\$13,800}{500 \text{ units}} = \$27.60$$

275 units × $27.60 = $7,590

* Alternatively, could be determined by multiplying the units sold by the average cost: 225 units × $27.60 = $6,210

Brief Exercise 8–14

Cost of goods available for sale:

Beginning inventory (20,000 × $25)	$ 500,000
Purchases:	
80,000 × $30	2,400,000
Cost of goods available (100,000 units)	2,900,000
Less: Ending inventory (15,000 units)	375,000*
Cost of goods sold	$2,525,000

*15,000 units × $25 each = $375,000

Brief Exercise 8–15

64,000 units were sold.

Cost of goods sold without year-end purchase:

Units purchased during the year: 60,000 × $18	$1,080,000
Plus units from beginning inventory: 4,000 × $15	60,000
Cost of goods sold	1,140,000

Cost of goods sold with year-end purchase:

64,000 units × $18	1,152,000
Difference	$ 12,000

Under LIFO, cost of goods sold would be $12,000 higher and **income before income taxes $12,000 lower** if the year-end purchase is made.

If FIFO were used instead of LIFO, the year-end purchase would have **no effect on income before income taxes**. FIFO cost of goods sold with or without the purchase would consist of the 10,000 units from beginning inventory and 54,000 units purchased during the year at $18:

10,000 units × $15	$ 150,000
Plus: 54,000 units × $18	972,000
Cost of goods sold	$1,122,000

Brief Exercise 8–16

Units liquidated	5,000
Difference in cost ($30 – $25)	× $5
Before-tax LIFO liquidation profit	$25,000
Tax effect ($25,000 × 25%)	(6,250)
LIFO liquidation profit	**$18,750**

Brief Exercise 8–17

Cost of goods sold	15,000	
LIFO reserve ($75,000 − $60,000)..................................		15,000

The LIFO reserve has increased from $60,000 to $75,000. Inventory is reduced with the use of the LIFO reserve, a contra account to inventory. Thus, an increase of the LIFO reserve is a credit in the adjusting entry.

Brief Exercise 8–18

LIFO reserve ($60,000 − $45,000)	15,000	
Cost of goods sold...		15,000

The LIFO reserve has decreased from $60,000 to $45,000. Inventory is reduced with the use of the LIFO reserve, a contra account to inventory. Thus, a decrease of the LIFO reserve is a debit in the adjusting entry.

Brief Exercise 8–19

Cost of goods sold for the year ended August 31, 2020, would have been **$100 million lower** had Walgreens used FIFO for its LIFO inventory. The LIFO reserve increased in 2020 by $100 million, from $3,200 million to $3,300 million. An increase in the LIFO reserve has the effect of increasing cost of goods sold when converting from FIFO to LIFO. So, to convert in the opposite direction from LIFO to FIFO, we would subtract the increase in the LIFO reserve from the LIFO amount of cost of goods sold to calculate FIFO cost of goods sold.

Cost of goods sold as reported (LIFO)	$111,520 million
Decrease to convert to FIFO	(100) million
Cost of goods sold (FIFO)	**$111,420 million**

Brief Exercise 8–20

Gross profit ratio = (sales revenue – cost of goods sold) / sales revenue
Gross profit ratio = ($560,000 − $320,000) / $560,000 = **42.86%**

Inventory turnover ratio = cost of goods sold / average inventory
Average inventory = ($60,000 + 48,000) ÷ 2 = $54,000
Inventory turnover ratio = $320,000 / $54,000 = **5.93**

Brief Exercise 8–21

Date	Ending Inventory at Base Year Cost	Inventory Layers at Base Year Cost	Inventory Layers Converted to Cost	Inventory DVL Cost
1/1/2024	$\dfrac{\$1,400,000}{1.00} = \$1,400,000$	$1,400,000 (base)	$1,400,000 × 1.00 = $1,400,000	$1,400,000
12/31/2024	$\dfrac{\$1,664,000}{1.04} = \$1,600,000$	$1,400,000 (base) 200,000 (2024)	$1,400,000 × 1.00 = $1,400,000 200,000 × 1.04 = 208,000	**$1,608,000**

EXERCISES

Exercise 8–1

1. To record the purchase of inventory on account and the payment of freight charges.

Inventory	5,000	
Accounts payable		5,000
Inventory	300	
Cash...		300

2. To record purchase returns.

Accounts payable	600	
Inventory		600

3. To record cash sales and cost of goods sold.

Cash..	5,200	
Sales revenue...		5,200
Cost of goods sold..	2,800	
Inventory		2,800

Exercise 8–2

1. To record the purchase of inventory on account and the payment of freight charges.

Purchases	5,000	
Accounts payable..		5,000
Freight-in	300	
Cash		300

2. To record purchase returns.

Accounts payable..	600	
Purchase returns...		600

3. To record cash sales.

Cash	5,200	
Sales revenue		5,200
NO ENTRY IS MADE FOR THE COST OF GOODS SOLD.		

Exercise 8–3

Beginning inventory		$ 32,000
Plus net purchases:		
Purchases	$240,000	
Less: Purchase discounts	(6,000)	
Less: Purchases returns	(10,000)	
Plus: Freight-in	17,000	241,000
Cost of goods available for sale		273,000
Less: Ending inventory		(40,000)
Cost of goods sold		$233,000

Exercise 8–4

PERPETUAL SYSTEM			PERIODIC SYSTEM		
		($ in 000s)			
Purchases					
Inventory	155		Purchases	155	
Accounts payable		155	Accounts payable		155
Freight					
Inventory	10		Freight-in	10	
Cash		10	Cash		10
Returns					
Accounts payable	12		Accounts payable	12	
Inventory		12	Purchase returns		12
Sales					
Accounts receivable	250		Accounts receivable	250	
Sales revenue		250	Sales revenue		250
Cost of goods sold	148		No entry		
Inventory		148			
End of period					
No entry			Cost of goods sold (below)	148	
			Inventory (ending)	30	
			Purchase returns	12	
			Inventory (beginning)		25
			Purchases		155
			Freight-in		10

Cost of goods sold:

Beginning inventory		$25
Purchases	$155	
Less: Returns	(12)	
Plus: Freight-in	10	
Net purchases		153
Cost of goods available		178
Less: Ending inventory		(30)
Cost of goods sold		$148

Exercise 8–5

	2024	2025	2026
Beginning inventory	275 (1)	249 (3)	225
Cost of goods sold	627	621	584 (6)
Ending inventory	249 (2)	225	216
Cost of goods available for sale	876	846 (4)	800
Purchases (gross)	630	610 (5)	585
Purchase discounts	18	15	12 (7)
Purchase returns	24	30	14
Freight-in	13	32	16

Net purchases = Purchases (gross) – Purchase returns – Purchase discounts + Freight-in
Beginning inventory + Net purchases = Cost of goods available for sale
Cost of goods available for sale – Ending inventory = Cost of goods sold

2024:
(1) Cost of goods available for sale – Net purchases = Beginning inventory
    876 – (630 – 18 – 24 + 13) = **275** = Beginning inventory

(2) Cost of goods available for sale – Cost of goods sold = Ending inventory
    876 – 627 = **249** = Ending inventory

2025:
(3) 2025 beginning inventory = 2024 ending inventory = **249**

(4) Cost of goods sold + Ending inventory = Cost of goods available for sale
    621 + 225 = **846** = Cost of goods available for sale

(5) Cost of goods available for sale – Beginning inventory = Net purchases
    846 – 249 = 597 = Net purchases

Net purchases + Purchases discounts + Purchase returns – Freight-in = Purchases (gross)
    597 + 15 + 30 – 32 = **610** = Purchases (gross)

2026:
(6) Cost of goods available for sale – Ending inventory = Cost of goods sold
    800 – 216 = **584** = Cost of goods sold

Exercise 8–5 (concluded)

(7) Cost of goods available for sale – Beginning inventory = Net purchases
800 – 225 = 575 = Net purchases
Purchases (gross) – Purchase returns + Freight-in – Net purchases = Purchase discounts
585 – 14 + 16 – 575 = **12** = Purchase discounts

Exercise 8–6

Inventory balance before additional transactions	$165,000
Add:	
2. Goods shipped to Kwik f.o.b. shipping point on December 28	17,000
3. Goods shipped to customer f.o.b. destination on December 27	22,000
Correct inventory balance	$204,000

Exercise 8–7

Inventory balance before additional transactions	$210,000
Add:	
4. Merchandise on consignment with Juniper Corp.	15,000
Deduct:	
1. Merchandise shipped to Almond f.o.b. destination on December 26	(30,000)
2. Merchandise held on consignment from the Hardgrove Company	(14,000)
Correct inventory balance	$181,000

Exercise 8–8

1. Excluded
2. Included
3. Included
4. Excluded
5. Included
6. Excluded
7. Included

Exercise 8–9

Requirement 1

Purchase price $= 1{,}000 \text{ units} \times \$50 = \$50{,}000$

July 15, 2024

Inventory...	50,000	
Accounts payable..		50,000

July 23, 2024

Accounts payable...	50,000	
Cash (98% × $50,000)......................................		49,000
Inventory (2% × $50,000).................................		1,000

Requirement 2

August 15, 2024

Accounts payable...	50,000	
Cash		50,000

Requirement 3

The July 15 entry would include a debit to the *Purchases* account instead of to *Inventory*, and the July 23 entry would include a credit to the *Purchase Discounts* account instead of to *Inventory*.

Exercise 8–10

Requirement 1

July 15, 2024

Inventory (98% × $50,000)	49,000	
Accounts payable		49,000

July 23, 2024

Accounts payable	49,000	
Cash		49,000

Requirement 2

August 15, 2024

Accounts payable	49,000	
Purchase discounts lost	1,000	
Cash		50,000

Requirement 3

The July 15 entry would include a debit to the *Purchases* account instead of to *Inventory*.

Exercise 8–11

Requirement 1

Purchases: $\$500 \times 70\% = \$350$ per unit.

100 units $\times \$350 = \$35,000$

November 17, 2024

Inventory...	35,000	
Accounts payable...		35,000

November 26, 2024

Accounts payable	35,000	
Inventory (2% × $35,000).................................		700
Cash (98% × $35,000)......................................		34,300

Requirement 2

December 15, 2024

Accounts payable..	35,000	
Cash		35,000

Exercise 8–11 (concluded)

Requirement 3

Requirement 1:

November 17, 2024

Inventory (98% × $35,000)... 34,300

   Accounts payable   34,300

November 26, 2024

Accounts payable 34,300

   Cash...   34,300

Requirement 2:

December 15, 2024

Accounts payable 34,300

Purchase discounts lost (2% × $35,000)...........................   700

   Cash...   35,000

Exercise 8–12

The *FASB Accounting Standards Codification*® represents the single source of authoritative U.S. generally accepted accounting principles. The specific citation for each of the following items is:

1. **Define the meaning of cost as it applies to the initial measurement of inventory.**

   FASB ASC 330–10–30–1: "Inventory–Overall–Initial Measurement."

   The primary basis of accounting for inventories is cost, which has been defined generally as the price paid or consideration given to acquire an asset. As applied to inventories, cost means in principle the sum of the applicable expenditures and charges directly or indirectly incurred in bringing an article to its existing condition and location. It is understood to mean acquisition and production cost, and its determination involves many considerations.

2. **Indicate the circumstances when it is appropriate to initially measure agricultural inventory at fair value.**

   FASB ASC 905–330–30–1: "Agriculture–Inventory–Initial Measurement."

   Exceptional cases exist in which it is not practicable to determine an appropriate cost basis for products. A market basis is acceptable if the products meet all of the following criteria:

   - a. They have immediate marketability at quoted market prices that cannot be influenced by the producer.

   - b. They have characteristics of unit interchangeability.

   - c. They have relatively insignificant costs of disposal.

   The accounting basis of those kinds of inventories shall be their realizable value, calculated on the basis of quoted market prices less estimated direct costs of disposal. An example is freshly dressed meats produced in meat packing operations.

3. **What is a major objective of accounting for inventory?**

   FASB ASC 330–10–10–1: "Inventory–Overall–Objectives."

   A major objective of accounting for inventories is the proper determination of income through the process of matching appropriate costs against revenues.

4. **Are abnormal freight charges included in the cost of inventory?**

   FASB ASC 330–10–30–7: "Inventory–Overall–Initial Measurement."

   Unallocated overheads shall be recognized as an expense in the period in which they are incurred. Other items such as abnormal freight, handling costs, and amounts of wasted materials (spoilage) require treatment as current period charges rather than as a portion of the inventory cost.

Exercise 8–13

Cost of goods available for sale:

Beginning inventory (2,000 × $5.30)		$10,600
Purchases:		
8,000 × $5.50	$44,000	
6,000 × $5.60	33,600	
4,000 × $5.80	23,200	100,800
Cost of goods available (20,000 units)		$111,400

First-in, first-out (FIFO)

Cost of goods available for sale (20,000 units)	$111,400
Less: Ending inventory (determined below)	(40,000)
Cost of goods sold	$ 71,400

Cost of ending inventory:

Date of purchase	Units	Unit cost	Total cost
August 18	3,000	$5.60	$16,800
August 28	4,000	$5.80	23,200
Total			$40,000

Last-in, first-out (LIFO)

Cost of goods available for sale (20,000 units)	$111,400
Less: Ending inventory (determined below)	(38,100)
Cost of goods sold	$ 73,300

Cost of ending inventory:

Date of purchase	Units	Unit cost	Total cost
Beg. Inv.	2,000	$5.30	$10,600
August 8	5,000	5.50	27,500
Total			$38,100

Exercise 8–13 (concluded)

Average cost

Cost of goods available for sale (20,000 units) $111,400
Less: Ending inventory (determined below)   (38,990)
    Cost of goods sold $72,410 *

Cost of ending inventory:

$$\text{Weighted-average unit cost} = \frac{\$111,400}{20,000 \text{ units}} = \$5.57$$

7,000 units $\times$ $5.57 = $38,990

* Alternatively, could be determined by multiplying the units sold by the average
cost: 13,000 units $\times$ $5.57 = $72,410

Exercise 8–14
First-in, first-out (FIFO)

Cost of goods sold:

Date of Sale	Units Sold	Cost of Units Sold	Total Cost
Aug. 14	2,000 (from Beg. Inv.)	$5.30	$10,600
	4,000 (from 8/8 purchase)	5.50	22,000
Aug. 25	4,000 (from 8/8 purchase)	5.50	22,000
	3,000 (from 8/18 purchase)	5.60	16,800
Total	13,000		$71,400

Ending inventory = (3,000 units × $5.60) + (4,000 units × $5.80) = $40,000

Exercise 8–14 (concluded)

Average cost

Date	Purchased	Sold	Balance	
Beginning inventory	2,000 @ $5.30 = $10,600		2,000 @ $5.30	$10,600
August 8	8,000 @ $5.50 = $44,000			
Available	$\dfrac{\$54,600}{10,000 \text{ units}}$ = $5.46/unit			
August 14		6,000 @ $5.46 = $32,760	4,000 @ $5.46	$21,840
August 18	6,000 @ $5.60 = $33,600			
Available	$\dfrac{\$55,440}{10,000 \text{ units}}$ = $5.544/unit			
August 25		7,000 @ $5.544 = $38,808	3,000 @ $5.544	$16,632
August 28	4,000 @ $5.80 = $23,200		*Ending inventory =* **$39,832**	
		Total cost of goods sold = **$71,568**		

Exercise 8–15
Last-in, first-out (LIFO)

Date	Purchased	Sold	Balance	
Beginning inventory	2,000 @ $5.30 = $10,600		2,000 @ $5.30	$10,600
August 8	8,000 @ $5.50 = $44,000		2,000 @ $5.30 8,000 @ $5.50	$54,600
August 14		6,000 @ $ 5.50 = $33,000	2,000 @ $5.30 2,000 @ $5.50	$21,600
August 18	6,000 @ $5.60 = $33,600		2,000 @ $5.30 2,000 @ $5.50 6,000 @ $5.60	$55,200
August 25		1,000 @ $5.50 = $ 5,500 6,000 @ $5.60 = $33,600	2,000 @ $5.30 1,000 @ $5.50	$16,100
August 28	4,000 @ $5.80 = $23,200		2,000 @ $5.30 1,000 @ $5.50 4,000 @ $5.80	**$39,300** *Ending inventory*
	Total cost of goods sold	= **$72,100**		

Exercise 8–16

Requirement 1

LIFO will result in the highest cost of goods sold figure because both the cost of merchandise and the quantity of merchandise rose during the period. FIFO will result in the highest ending inventory balance for the same reasons.

Requirement 2

Cost of goods available for sale:

Beginning inventory (600 × $80)		$ 48,000
Purchases:		
1,000 × $ 95	$95,000	
800 × $100	80,000	175,000
Cost of goods available (2,400 units)		$223,000

First-in, first-out (FIFO)

Cost of goods available for sale (2,400 units)	$223,000
Less: Ending inventory (below)	(80,000)
Cost of goods sold	$143,000

Cost of ending inventory:

Date of purchase	Units	Unit cost	Total cost
January 21	800	$100	$80,000

Last-in, first-out (LIFO)

Cost of goods available for sale (2,400 units)	$223,000
Less: Ending inventory (below)	(67,000)
Cost of goods sold	$156,000

Cost of ending inventory:

Date of purchase	Units	Unit cost	Total cost
Beg. Inv.	600	$80	$48,000
January 15	200	95	19,000
Total			$67,000

Exercise 8–16 (concluded)

Requirement 3
    FIFO will result in the highest cost of goods sold figure because the cost of merchandise declined and the quantity of merchandise rose during the period. LIFO will result in the highest ending inventory balance for the same reasons.

Cost of goods available for sale:		
Beginning inventory (600 × $80)		$ 48,000
Purchases:		
1,000 × $70	$70,000	
800 × $65	52,000	122,000
Cost of goods available (2,400 units)		$170,000

First-in, first-out (FIFO)

Cost of goods available for sale (2,400 units)	$170,000
Less: Ending inventory (below)	(52,000)
Cost of goods sold	$118,000

Cost of ending inventory:

Date of purchase	**Units**	**Unit cost**	**Total cost**
January 21	800	$65	$52,000

Last-in, first-out (LIFO)

Cost of goods available for sale (2,400 units)	$170,000
Less: Ending inventory (below)	(62,000)
Cost of goods sold	$108,000

Cost of ending inventory:

Date of purchase	**Units**	**Unit cost**	**Total cost**
Beg. Inv.	600	$80	$48,000
January 15	200	70	14,000
Total			$62,000

Exercise 8–17

Requirement 1

Cost of goods available for sale:

Beginning inventory (5,000 × $10.00)		$ 50,000
Purchases:		
3,000 × $10.40	$31,200	
8,000 × $10.75	86,000	117,200
Cost of goods available (16,000 units)		$167,200

Cost of goods available for sale (16,000 units)	$167,200
Less: Ending inventory (below)	(73,150)
Cost of goods sold	$ 94,050*

Cost of ending inventory:

$$\text{Weighted-average unit cost} = \frac{\$167,200}{16,000 \text{ units}} = \$10.45$$

7,000 units × $10.45 = $73,150

* Alternatively, could be determined by multiplying the units sold by the average
  cost: 9,000 units × $10.45 = $94,050

Exercise 8–17 (concluded)

Requirement 2

Date	Purchased	Sold	Balance	
Beginning inventory	5,000 @ $10.00 = $50,000		5,000 @ $10.00	$50,000
September 7	3,000 @ $10.40 = $31,200			
Available	$\dfrac{\$81,200}{8,000 \text{ units}} = \$10.15/\text{unit}$			
September 10		4,000 @ $10.15 = $40,600	4,000 @ $10.15	$40,600
September 25	8,000 @ $10.75 = $86,000			
Available	$\dfrac{\$126,600}{12,000 \text{ units}} = \$10.55/\text{unit}$			
September 29		5,000 @ $10.55 = $52,750	7,000 @ $10.55	**$73,850** *Ending inventory*
	Total cost of goods sold	= **$93,350**		

Exercise 8–18

Requirement 1
FIFO cost of goods sold:

10,000 units @ $5.00	= $50,000
+ 10,000 units @ $6.00 (determined below)	= 60,000
	$110,000

Requirement 2
LIFO cost of goods sold:

20,000 units @ $6.00 (determined below)   = $120,000

Calculations to determine cost per unit of year 2024 purchases:

$$\frac{\text{Cost of goods sold}}{\text{Number of units sold}} = \text{Weighted-average cost per unit}$$

$$\frac{\$115,000}{20,000 \text{ units}} = \$5.75 \text{ per unit}$$

$5.75 \times 40,000$ units = $230,000 = Cost of goods available for sale

$230,000 – 50,000 (beginning inventory) = $180,000 = Cost of purchases

$$\frac{\$180,000}{30,000 \text{ units purchased}} = \$6 = \text{Cost per unit of year 2024 purchases}$$

Cost of goods available for sale:

Beginning inventory (10,000 × $5.00)	$ 50,000
Purchases (30,000 × $6.00)	180,000
Cost of goods available (40,000 units)	$230,000

Exercise 8–19

Requirement 1
First-in, first-out (FIFO)

Cost of goods sold:

Date of Sale	Units Sold	Cost of Units Sold	Total Cost
Apr. 30	20,000 (from Beg. Inv.)	$12.20	$ 244,000
	30,000 (from 2/12 purchase)	12.50	375,000
Sep. 9	40,000 (from 2/12 purchase)	12.50	500,000
	30,000 (from 7/22 purchase)	12.80	384,000
Total	120,000		$1,503,000

Ending inventory = (20,000 units × $12.80) + (40,000 units × $13.20)
= $784,000

Note that Telnex would achieve the same result if it used FIFO on a periodic basis rather than a perpetual basis. Its 120,000 units sold consist of the beginning inventory of 20,000 units, all 70,000 units purchased on 2/12, and 30,000 units purchased on 7/22. Telnex's numbers would be the same because, regardless of whether we view FIFO inventory on a perpetual or periodic basis, we always view the oldest units on hand as those that are the first to be sold.

Requirement 2
Last-in, first-out (LIFO)

Cost of goods available for sale:

Beginning inventory (20,000 × $11.70)		$ 234,000
Purchases:		
70,000 × $12.50	$875,000	
50,000 × $12.80	640,000	
40,000 × $13.20	528,000	2,043,000
Cost of goods available (180,000 units)		$2,277,000

Cost of goods available for sale (180,000 units)	$2,277,000
Less: Ending inventory (determined below)	(734,000)
Cost of goods sold	$1,543,000

Cost of ending inventory:

Date of purchase	Units	Unit cost	Total cost
Beg. Inv.	20,000	$11.70	$234,000
Feb. 12	40,000	12.50	500,000
Total			$734,000

Requirement 3
LIFO Reserve

Perpetual FIFO (Required 1)	$ 784,000
Less: Periodic LIFO (Required 2)	(734,000)
LIFO Reserve	**$ 50,000**

Requirement 4

Cost of goods sold	40,000	
LIFO reserve ($50,000 − $10,000).................................		40,000

Exercise 8–20

Requirement 1
Average Cost

Date	Purchased	Sold	Balance
Beginning inventory	80,000 @ $4.25 = $340,000		80,000 @ $4.25 = $340,000
Feb. 14	120,000 @ $4.50 = $540,000		200,000 @ $4.40 = $880,000
Available	$\dfrac{\$880,000}{200,000 \text{ units}} = \$4.40/\text{unit}$		
Mar. 5		150,000 @ $4.40 = $660,000	50,000 @ $4.40 = $220,000
Aug. 27	50,000 @ $4.80 = $240,000		100,000 @ $4.60 = $460,000
Available	$\dfrac{\$460,000}{100,000 \text{ units}} = \$4.60/\text{unit}$		
Sep. 12		60,000 @ $4.60 = $276,000	40,000 @ $4.60 = $184,000
Nov. 15	70,000 @ $4.90 = $343,000		110,000 @ $4.7909 = **$527,000** *Ending inventory*
	$\dfrac{\$527,000}{100,000 \text{ units}} = \$4.7909/\text{unit}$	*Total cost of goods sold =* **$936,000**	

Requirement 2
Last-in, first-out (LIFO)

    Cost of goods available for sale:
    Beginning inventory (80,000 × $4.00) $ 320,000
    Purchases:

Date of purchase	Units	Unit cost	Total cost	
120,000 × $4.50		$540,000		
50,000 × $4.80		240,000		
70,000 × $4.90		343,000	1,123,000	

    Cost of goods available (320,000 units) $1,443,000

Cost of goods available for sale (320,000 units)	$1,443,000
Less: Ending inventory (determined below)	(455,000)
Cost of goods sold	$ 988,000

Cost of ending inventory:

Date of purchase	Units	Unit cost	Total cost
Beg. Inv.	80,000	$4.00	$320,000
Feb. 14	30,000	$4.50	$135,000
			$455,000

Requirement 3
LIFO Reserve

Perpetual average (Required 1)	$ 527,000
Less: Periodic LIFO (Required 2)	(455,000)
LIFO Reserve	**$ 72,000**

Requirement 4

Cost of goods sold	52,000	
LIFO reserve ($72,000 − $20,000).................................		52,000

Exercise 8–21

Requirement 1

September 30, 2019		($ in millions)
LIFO reserve ($1,534 − $1,512)...	22	
Cost of goods sold		22

Requirement 2

$174,451 + $22 = **$174,473 million cost of goods sold under FIFO.**

Cost of goods sold is provided as $174,451 (million) on a LIFO basis. To convert LIFO to FIFO, the adjustment in Requirement 1 converting FIFO to LIFO is reversed and cost of goods sold is thereby increased by $22.

Exercise 8–22

Requirement 1

Cost of goods sold:

50,000 units × $8.50 =	$425,000
4,000 units × $7.00 =	28,000
	$453,000

Requirement 2

When inventory quantity declines during a reporting period, liquidation of LIFO inventory layers carried at different costs prevailing in prior years results in noncurrent costs being matched with current selling prices. If the resulting effect on income is material, it must be disclosed. In this case, the effect of the LIFO layer liquidation is to increase income (ignoring taxes) by $6,000 [4,000 units liquidated × $1.50 ($8.50 current year cost per unit – $7 LIFO layer cost per unit)].

Exercise 8–23

Units liquidated	<u>10,000</u>

Units liquidated multiplied by the difference between
their current cost and acquisition cost:

8,000 × ($12 – $9) =	$24,000
2,000 × ($12 – $8) =	<u>8,000</u>
Before-tax LIFO liquidation profit	**$32,000**

When inventory quantity declines during a reporting period, liquidation of LIFO inventory layers carried at different costs that prevailed in prior years results in noncurrent costs being matched with current selling prices. If the resulting effect on income is material, it must be disclosed. In this case, the effect of the LIFO layer liquidation is to decrease cost of goods sold and thereby to increase income before income taxes by $32,000.

Exercise 8–24

Requirement 1
The specific citation that describes the disclosure requirements that must be made by publicly traded companies for a LIFO liquidation is FASB ASC 330–10–S99–3: "Inventory–Overall–SEC Materials–LIFO Liquidations."

Requirement 2
When a company using LIFO liquidates a substantial portion of its inventory, the company must disclose the affect on income had the inventory liquidation not taken place. Such disclosure would be required in order to make the financial statements not misleading. Disclosure may be made either in a footnote or parenthetically on the face of the income statement.

Exercise 8–25

($ in millions)	**HOME DEPOT**		**LOWE'S**	
Gross profit ratio	$= \dfrac{37,572}{110,225}$	$= \mathbf{34.09\%}$	$\dfrac{22,943}{72,148}$	$= \mathbf{31.80\%}$
Inventory turnover	$= \dfrac{72,653}{14,228}$	$= \mathbf{5.11\ times}$	$\dfrac{49,205}{12,870}$	$= \mathbf{3.82\ times}$
Average days in inventory	$= \dfrac{365}{5.11}$	$= \mathbf{71\ days}$	$\dfrac{365}{3.82}$	$= \mathbf{96\ days}$

The gross profit ratios for the two companies are similar and both exceed the industry average of 27.25%. On average, Lowe's turns over its inventory 25 days slower than does Home Depot and both companies turn over their inventories faster than the industry average. This is not surprising, since Home Depot and Lowe's lead the market in size of stores and merchandise available, making it more difficult for smaller retailers to sell merchandise as quickly as these two companies.

Exercise 8–26

Date	Ending Inventory at Base Year Cost	Inventory Layers at Base Year Cost	Inventory Layers Converted to Cost	Inventory DVL Cost
1/1/2024	$\dfrac{\$660,000}{1.00} = \$660,000$	$660,000 (base)	$660,000 \times 1.00 = \$660,000$	**$660,000**
12/31/2024	$\dfrac{\$690,000}{1.04} = \$663,462$	$660,000 (base) 3,462 (2024)	$660,000 \times 1.00 = \$660,000$ $3,462 \times 1.04 = 3,600$	**663,600**
12/31/2025	$\dfrac{\$760,000}{1.08} = \$703,704$	$660,000 (base) 3,462 (2024) 40,242 (2025)	$660,000 \times 1.00 = \$660,000$ $3,462 \times 1.04 = 3,600$ $40,242 \times 1.08 = 43,461$	**707,061**

Exercise 8–27

Date	Ending Inventory at Base Year Cost	Inventory Layers at Base Year Cost	Inventory Layers Converted to Cost	Inventory DVL Cost
12/31/2024	$\dfrac{\$200{,}000}{1.00} = \$200{,}000$	$200,000 (base)	$200,000 × 1.00 = $200,000	**$200,000**
12/31/2025	$\dfrac{\$231{,}000}{\text{Index}} = \$220{,}000$	Index = 1.05		
		$200,000 (base) 20,000 (2025)	$200,000 × 1.00 = $200,000 20,000 × 1.05 = 21,000	**$221,000**
12/31/2026	$\dfrac{\$299{,}000}{\text{Index}} = \$260{,}000$	Index = 1.15		
		$200,000 (base) 20,000 (2025) 40,000 (2026)	$200,000 × 1.00 = $200,000 20,000 × 1.05 = 21,000 40,000 × 1.15 = 46,000	**$267,000**
12/31/2027	$\dfrac{\$300{,}000}{\text{Index}} = \$250{,}000$	Index = 1.20		
		$200,000 (base) 20,000 (2025) 30,000 (2026)	$200,000 × 1.00 = $200,000 20,000 × 1.05 = 21,000 30,000 × 1.15 = 34,500	**$255,500**

Exercise 8–28

Set the base year, 1/1/2024, equal to 1.00.

Cost index in layer year: $264 \div 240 = 1.10$

Date	Ending Inventory at Base Year Cost	Inventory Layers at Base Year Cost	Inventory Layers Converted to Cost	Inventory DVL Cost
1/1/2024	$\dfrac{\$720,000}{1.00} = \$720,000$	$720,000 (base)	$720,000 × 1.00 = $720,000	**$720,000**
12/31/2024	$\dfrac{\$880,000}{1.10} = \$800,000$	$720,000 (base) 80,000 (2024)	$720,000 × 1.00 = $720,000 80,000 × 1.10 = 88,000	**$808,000**

Exercise 8–29

		List A		List B
i	1.	Perpetual inventory system	a.	Legal title passes when goods are delivered to common carrier.
l	2.	Periodic inventory system	b.	Goods are transferred to another company but title remains with transferor.
a	3.	F.o.b. shipping point	c.	Purchases are recorded for the full cost of the inventory.
c	4.	Gross method	d.	If LIFO is used for taxes, it must be used for financial reporting.
g	5.	Net method	e.	Assumes items sold are those acquired first.
h	6.	Cost index	f.	Assumes items sold are those acquired last.
k	7.	F.o.b. destination	g.	Purchases are recorded for the full cost of the inventory less any possible discount.
e	8.	FIFO	h.	Used to convert ending inventory at year-end cost to base year cost.
f	9.	LIFO	i.	Continuously records changes in inventory.
b	10.	Consignment	j.	Items sold come from a mixture of goods acquired during the period.
j	11.	Average cost	k.	Legal title passes when goods arrive at location.
d	12.	IRS conformity rule	l.	Adjusts inventory at the end of the period.

Exercise 8–30
Requirement 1

a.	Debit	Credit
Inventory	**330,000**	
Accounts Payable		**330,000**
(Purchased inventory on account)		

b.	Debit	Credit
Accounts Receivable	**570,000**	
Sales Revenue		**570,000**
(Sold inventory on account)		
Cost of Goods Sold	**310,000**	
Inventory		**310,000**
(Record cost of inventory sold)		

c.	Debit	Credit
Cash	**540,000**	
Accounts Receivable		**540,000**
(Received cash on account)		

d.	Debit	Credit
Inventory	**24,000**	
Cash		**24,000**
(Paid freight on inventory received)		

e.	Debit	Credit
Accounts Payable	**325,000**	
Inventory		**5,000**
Cash		**320,000**
(Paid cash on account)		

f.	Debit	Credit
Rent Expense	**42,000**	
Cash		**42,000**
(Paid rent)		

g.	Debit	Credit
Salaries Expense	**150,000**	
Cash		**150,000**
(Paid salaries)		

Requirement 2

	Debit	Credit
(a) December 31		
Supplies Expense	**17,000**	
Supplies		**17,000**
(Record supplies used)		
($17,000 = $25,000 − $8,000)		

	Debit	Credit
(b) December 31		
Interest Expense	**1,000**	
Interest Payable		**1,000**
(*Record interest expense not yet paid*)		
($1,000 = $20,000 × 5%)		

	Debit	Credit
(c) December 31		
Income Tax Expense	**18,000**	
Income Taxes Payable		**18,000**
(*Record income taxes not yet paid*)		

Requirement 3

Displays Incorporated
Adjusted Trial Balance
December 31, 2024

Accounts	Debit	Credit
Cash	$ 26,000	
Accounts Receivable	49,000	
Supplies	8,000	
Inventory	99,000	
Land	227,000	
Accounts Payable		$ 23,000
Interest Payable		1,000
Income Taxes Payable		18,000
Notes Payable		20,000
Common Stock		186,000
Retained Earnings		129,000
Sales Revenue		570,000
Cost of Goods Sold	310,000	
Rent Expense	42,000	
Salaries Expense	150,000	
Supplies Expense	17,000	
Interest Expense	1,000	
Income Tax Expense	18,000	
Totals	$947,000	$947,000

Requirement 3 (continued)

Accounts	Ending Balance		Beginning balance in **bold**, entries during January in blue, and adjusting entries in red.
Cash	$ 26,000	=	**22,000**+540,000−24,000−320,000−42,000−150,000
Accounts Receivable	49,000	=	**19,000**+570,000−540,000
Supplies	8,000	=	**25,000**−17,000
Inventory	99,000	=	**60,000**+330,000−310,000+24,000−5,000
Land	227,000	=	**227,000**
Accounts Payable	23,000	=	**18,000**+330,000−325,000
Interest Payable	1,000	=	1,000
Income Taxes Payable	18,000	=	18,000
Notes Payable	20,000	=	**20,000**
Common Stock	186,000	=	**186,000**
Retained Earnings	129,000	=	**129,000**
Sales Revenue	570,000	=	570,000
Cost of Goods Sold	310,000	=	310,000
Rent Expense	42,000	=	42,000
Salaries Expense	150,000	=	150,000
Supplies Expense	17,000	=	17,000
Interest Expense	1,000	=	1,000
Income Tax Expense	18,000	=	18,000

Requirement 4

Displays Incorporated
Income Statement
For the year ended December 31, 2024

Sales revenue	$570,000	
Cost of goods sold	310,000	
Gross profit		$260,000
Rent expense	42,000	
Salaries expense	150,000	
Supplies expense	17,000	
Total operating expenses		209,000
Operating income		51,000
Interest expense		1,000
Income before taxes		50,000
Income tax expense		18,000
Net income		$ 32,000

Requirement 5

Displays Incorporated
Balance Sheet
December 31, 2024

Assets		**Liabilities**	
Cash	$ 26,000	Accounts payable	$ 23,000
Accounts receivable	49,000	Income taxes payable	18,000
Supplies	8,000	Interest payable	1,000
Inventory	99,000	Notes payable	20,000
Total current assets	182,000	Total liabilities	62,000
Land	227,000	**Stockholders' Equity**	
		Common stock	186,000
		Retained earnings	161,000 *
		Total stockholders' equity	347,000
		Total liabilities and	
Total assets	$409,000	stockholders' equity	$409,000

* Retained earnings = Beginning retained earnings + Net income − Dividends
 = $129,000 + $32,000 − $0
 = $161,000

Requirement 6

December 31, 2024	Debit	Credit
Sales Revenue	570,000	
Retained Earnings		570,000
(*Close revenue accounts*)		
Retained Earnings	538,000	
Cost of Goods Sold		310,000
Rent Expense		42,000
Salaries Expense		150,000
Supplies Expense		17,000
Interest Expense		1,000
Income Tax Expense		18,000
(*Close expense accounts*)		

Requirement 7

(a) The LIFO reserve is:

Internal records (FIFO)	$99,000
External reporting (LIFO)	85,000
LIFO reserve	**$14,000**

(b)   Step 1: $99,000 / 1.10 = $90,000 ending inventory at base year cost

        Step 2: $60,000 beginning inventory
                      30,000 new layer in 2024
                $90,000 ending inventory at base year cost

        Step 3: $60,000 × 1.00 = $60,000
                30,000 × 1.10 = $33,000
                              $93,000 ending inventory using dollar-value LIFO

(c) Indicate whether each of the ratios below generally would be <u>higher</u> or <u>lower</u> when reporting inventory using LIFO (or dollar-value LIFO) instead of FIFO in periods of rising inventory costs and stable inventory quantities.
      1. Inventory turnover ratio – **higher under LIFO**
      2. Average days in inventory – **lower under LIFO**
      3. Gross profit ratio – **lower under LIFO**

Exercise 8–31
Requirement 1

January 2	Debit	Credit
Notes Receivable	**20,000**	
Cash		**20,000**
(Accepted 6% note receivable due in six months)		

January 5	Debit	Credit
Inventory	**385,000**	
Accounts Payable		**385,000**
(Purchased inventory on account)		

January 8	Debit	Credit
Accounts Payable	**11,000**	
Inventory		**11,000**
(Returned 100 units of inventory; 110×100 units)		

January 15	Debit	Credit
Accounts Receivable	**429,000**	
Sales Revenue		**429,000**
(Sold inventory on account)		
Cost of Goods Sold	**360,000**	
Inventory		**360,000**
(Recorded cost of inventory sold)		
($360,000 = [\$100\times300$ units$]+[\$110\times3,000$ units$])		

January 17	Debit	Credit
Sales Returns	**26,000**	
Accounts Receivable		**26,000**
(Customer returned inventory; 130×200 units)		
Inventory	**22,000**	
Cost of Goods Sold		**22,000**
(Customer returned inventory; 110×200 units)		

January 20	Debit	Credit
Cash	**379,980**	
Sales Discounts $(($130 \times 2,700) \times 2\%)$	**7,020**	
Accounts Receivable $($36,000 + ($130 \times 2,700))$		**387,000**
(Received cash from customers on account)		

January 21	Debit	Credit
Allowance for Uncollectible Accounts	**4,000**	
Accounts Receivable		**4,000**
(Wrote off uncollectible accounts)		
($40,000 - $36,000)		

January 24	Debit	Credit
Accounts Payable	**361,000**	
Cash		**361,000**
(Paid cash on account; $110 \times 3,100$ units) + $20,000)		

January 28	Debit	Credit
Salaries Expense	**28,000**	
Cash		**28,000**
(*Paid salaries for the current period*)		

January 29	Debit	Credit
Utilities Expense	**10,000**	
Cash		**10,000**
(*Paid utilities for the current period*)		

January 30	Debit	Credit
Dividends	**3,000**	
Cash		**3,000**
(*Paid dividends*)		

Requirement 2

January 31	Debit	Credit
Bad Debt Expense	**4,200**	
Allowance for Uncollectible Accounts		**4,200**
(*Estimated uncollectible accounts*)		
($4,200 = ($52,000 × 10%) − $1,000)		

January 31	Debit	Credit
Interest Receivable	**100**	
Interest Revenue		**100**
(*Record interest receivable*)		
($20,000 × 6% × 1/12 = $100)		

January 31	Debit	Credit
Interest Expense	**240**	
Interest Payable		**240**
(*Record interest payable*)		
($36,000 × 8% × 1/12 = $240)		

January 31	Debit	Credit
Income Tax Expense	**5,000**	
Income Taxes Payable		**5,000**
(*Record income taxes payable*)		

January 31	Debit	Credit
Depreciation Expense	**2,000**	
Accumulated Depreciation		**2,000**
(*Record depreciation*)		

Requirement 3

Tripley Company
Adjusted Trial Balance
January 31, 2024

Accounts	Debit	Credit
Cash	$ 27,980	
Accounts Receivable	52,000	
Allowance for Uncollectible Accounts		$ 5,200
Interest Receivable	100	
Notes Receivable	20,000	
Inventory	66,000	
Building	70,000	
Accumulated Depreciation		12,000
Land	200,000	
Accounts Payable		33,000
Interest Payable		240
Income Taxes Payable		5,000
Notes Payable		36,000
Common Stock		100,000
Retained Earnings		239,000
Dividends	3,000	
Sales Revenue		429,000
Sales Returns	26,000	
Sales Discounts	7,020	
Interest Revenue		100
Cost of Goods Sold	338,000	
Salaries Expense	28,000	
Utilities Expense	10,000	
Bad debt Expense	4,200	
Depreciation Expense	2,000	
Interest Expense	240	
Income Tax Expense	5,000	
Totals	$859,540	$859,540

Requirement 4

Tripley Company
Income Statement
For the year ended January 31, 2024

Sales revenue	$429,000	
Less: Sales returns	(26,000)	
Sales discounts	(7,020)	
Net sales revenue		$395,980
Cost of goods sold		338,000
Gross profit		57,980
Operating expenses:		
Salaries expense	28,000	
Utilities expense	10,000	
Bad debt expense	4,200	
Depreciation expense	2,000	44,200
Operating income		13,780
Other income (expenses):		
Interest revenue	100	
Interest expense	(240)	(140)
Income before taxes		13,640
Income tax expense		5,000
Net income		$ 8,640

Requirement 5

<div align="center">

Tripley Company
Balance Sheet
January 31, 2024

</div>

Assets			Liabilities		
Cash		$ 27,980	Accounts payable		$ 33,000
Accounts receivable	52,000		Interest payable		240
Less: Allowance for			Income taxes payable		5,000
uncollectible accounts	(5,200)	46,800			
Interest receivable		100	Total current liabilities		38,240
Notes receivable		20,000	Notes payable		36,000
Inventory		66,000	Total liabilities		74,240
Total current assets		160,880			
Property, plant, and equipment:			**Stockholders' Equity**		
Building		70,000	Common stock		100,000
Less: Accumulated depreciation		(12,000)	Retained earnings		244,640 *
Land		200,000	Total stockholders' equity		344,640
			Total liabilities and		
Total assets		$418,880	stockholders' equity		$418,880

* Retained earnings = Beginning retained earnings + Net income − Dividends
= $239,000 + $8,640 − $3,000
= $244,640

Requirement 6

January 31	Debit	Credit
Sales revenue	**429,000**	
Interest revenue	**100**	
Retained Earnings		**429,100**
(Close temporary credit accounts)		

January 31	Debit	Credit
Retained Earnings	**423,460**	
Sales returns		**26,000**
Sales discounts		**7,020**
Cost of goods sold		**338,000**
Salaries expense		**28,000**
Utilities expense		**10,000**
Bad debt expense		**4,200**
Depreciation expense		**2,000**
Interest expense		**240**
Income tax expense		**5,000**
Dividends		**3,000**
(Close temporary debit accounts)		

Requirement 7

(a) The inventory turnover ratio is:

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} = \frac{\$338,000}{(\$30,000 + \$66,000)/2} = \textbf{7.0}$$

A ratio of 7.0 suggests that the average inventory balance is sold 7.0 times over the period. Typically, a higher ratio is good. The industry average inventory turnover ratio is lower at 4.5, so the company is selling its inventory **more** quickly than the average company in the same industry.

(b) The gross profit ratio is:

$$\text{Gross Profit Ratio} = \frac{(\text{Net Sales} - \text{Cost of Goods Sold})}{\text{Net Sales}} = \frac{(\$395,980 - \$338,000)}{\$395,980} = \textbf{14.6\%}$$

A gross profit ratio of 14.6% suggests that for every $1 of sales, the company spends $0.854 on inventory ($1.00 − $0.146), resulting in a gross profit of $0.146. The industry average gross profit ratio is higher at 33%, so the company is **less** profitable per dollar of sales than the average company in the same industry.

(c) Based on the inventory turnover ratio and the gross profit ratio, the company's business strategy appears to be selling a **high volume of less profitable** items. In general, lower priced items sell more frequently.

PROBLEMS

Problem 8–1

Requirement 1

a. To record the purchase of inventory on account and the payment of freight charges.

October 12		
Inventory (98% × $22,000)	21,560	
Accounts payable		21,560
Inventory..	500	
Cash		500

b. To record payment of accounts payable.

October 31		
Accounts payable...	21,560	
Purchase discounts lost..	440	
Cash		22,000

c. To record sales on account.

During October		
Accounts receivable..	28,000	
Sales revenue		28,000
Cost of goods sold	18,000	
Inventory...		18,000

No entry is needed for item d.

Problem 8–1 (continued)

Requirement 2

a.   To record the purchase of inventory on account and the payment of freight charges.

> **October 12**
> Purchases (98% × $22,000) 21,560
>   Accounts payable 21,560
>
> Freight-in... 500
>   Cash.. 500

b.   To record payment of accounts payable.

> **October 31**
> Accounts payable 21,560
> Interest expense... 440
>   Cash.. 22,000

Problem 8–1 (concluded)

c. To record sales on account.

> **During October**
> Accounts receivable.. 28,000
>   Sales revenue 28,000
>   No entry is made for the cost of goods sold.

d.

Cost of goods sold:

Beginning inventory		$15,000
Plus net purchases:		
Purchases	$21,560	
Plus: Freight-in	500	22,060
Cost of goods available for sale		37,060
Less: Ending inventory		(19,060)
Cost of goods sold		$18,000

Adjusting entry:

> **October 31**
> Cost of goods sold (above*) 18,000
> Inventory (ending) 19,060
>   Inventory (beginning).. 15,000
>   Purchases 21,560
>   Freight-in 500

If Autumn considers the purchase discount lost of $440 on October 31 to be an increase in cost of goods sold, then the Purchase Discounts Lost account would be debited on October 31 and credited (closed) in this year-end adjusting entry, increasing cost of goods sold to $18,440 ($18,000 + $440).

Problem 8–2

1. The transaction *is not* correctly accounted for. Inventory held on consignment by another company should be included in the inventory of the consignor. Rasul should include this merchandise in its 2024 ending inventory.
2. The transaction *is not* correctly accounted for. Legal title to merchandise shipped f.o.b. shipping point changes hands when the goods are shipped. Rasul should record the purchase and corresponding account payable in 2024 and include the merchandise in its 2024 ending inventory.
3. The transaction *is not* correctly accounted for. Since the merchandise was shipped f.o.b. destination and did not arrive at the customer's location until 2025, it should be included in Rasul's 2024 ending inventory. The sale should be recorded in 2025.
4. The transaction *is* correctly accounted for. Merchandise held on consignment from another company belongs to the consignor and should be excluded from the inventory of the consignee.
5. The transaction *is* correctly accounted for. Since the merchandise was shipped f.o.b. destination and did not arrive at Rasul's location until 2025, it should not be included in Rasul's 2024 ending inventory. The purchase is correctly recorded in 2025.

Problem 8–3

	Inventory	Accounts Payable	Sales
Initial amounts	$1,250,000	$1,000,000	$9,000,000
Adjustments - increase (decrease):			
1.	(155,000)	(155,000)	NONE
2.	(22,000)	NONE	NONE
3.	NONE	NONE	40,000
4.	210,000	NONE	NONE
5.	25,000	25,000	NONE
6.	2,000	2,000	NONE
7.	(5,300)	(5,300)	NONE
Total adjustments	54,700	(133,300)	40,000
Adjusted amounts	$1,304,700	$ 866,700	$9,040,000

Problem 8–4

Requirement 1

Even though specific dates for purchases and sales of inventory are not given, amounts for ending inventory and cost of goods sold under FIFO are the same using calculations under a periodic or perpetual inventory system. Therefore, we can calculate perpetual FIFO as follows:

Beginning inventory (10,000 × $8.00)		$ 80,000
Net purchases:		
Purchases (50,000* units × $10.00)	$500,000	
Less: Purchase returns (1,000 units × $10.50)	(10,500)	
Less: Purchase discounts		
($490,000 × 2%)	(9,800)	
Plus: Freight-in (50,000 units × $0.50)	25,000	504,700
Cost of goods available (59,000 units)		584,700
Less: Ending inventory (below)		(144,200)
Cost of goods sold (45,000 units)		$440,500

* The 5,000 units purchased on December 28 are not included. The merchandise was shipped f.o.b. destination and did not arrive at Jillet's warehouse until the following year.

Cost of ending inventory:

Date of purchase	Units	Unit cost	Total cost
During the year	14,000	10.30**	$144,200

**($10 × 98%) + $0.50 per unit freight-in charge = $10.30 per unit

Requirement 2

Sales (45,000 units × $18.00)		$810,000
Less:		
Cost of goods sold (above)	$440,500	
Other operating expenses	150,000	(590,500)
Income before income taxes		$219,500

Requirement 3

Cost of ending inventory under LIFO (periodic inventory system):

Date of purchase	Units	Unit cost	Total cost
Beg. Inv.	10,000	$ 8.00	$ 80,000
During the year	4,000	10.30***	41,200
Total	14,000		$121,200

***($10 × 98%) + $0.50 per unit freight-in charges = $10.30

LIFO Reserve

Perpetual FIFO (Required 1)	$ 144,200
Less: Periodic LIFO (above)	(121,200)
LIFO Reserve	$ 23,000

Cost of goods sold	8,000	
LIFO reserve ($23,000 − $15,000).................................		8,000

Requirement 4

Sales (45,000 units × $18.00)		$810,000
Less:		
Cost of goods sold****	$448,500	
Other operating expenses	150,000	(598,500)
Income before income taxes		$211,500

**** $440,500 (Required 2 using FIFO) + $8,000 (Required 3 LIFO reserve adjustment) = $448,500.

Problem 8–5

Cost of goods available for sale for periodic system:

Beginning inventory (6,000 × $8.00)		$ 48,000
Purchases:		
5,000 × $ 9.00	$45,000	
6,000 × $10.00	60,000	105,000
Cost of goods available (17,000 units)		$153,000

1. FIFO, periodic system

Cost of goods available for sale (17,000 units)		$153,000
Less: Ending inventory (determined below)		(78,000)
Cost of goods sold		$ 75,000

Cost of ending inventory:

Date of purchase	Units	Unit cost	Total cost
Jan. 10	2,000	$ 9.00	$18,000
Jan. 18	6,000	10.00	60,000
Totals	8,000		$78,000

Alternatively, cost of goods sold can be determined by adding the cost of the 6,000 units in beginning inventory ($48,000) and the 3,000 units from the January 10 purchase ($27,000) = $75,000.

2. LIFO, periodic system

Cost of goods available for sale (17,000 units) $153,000
Less: Ending inventory (determined below)   (66,000)
    Cost of goods sold $ 87,000

Cost of ending inventory:

Date of purchase	Units	Unit cost	Total cost
Beg. Inv.	6,000	$8.00	$48,000
Jan. 10	2,000	9.00	18,000
Totals	8,000		$66,000

Alternatively, cost of goods sold can be determined by adding the cost of the 6,000 units from the January 18 purchase ($60,000) and the 3,000 units from the January 10 purchase ($27,000) = $87,000.

3. FIFO, perpetual system

Date	Purchased		Sold		Balance	
Beginning inventory	6,000 @ $8.00 =	$48,000			6,000 @ $8.00	$48,000
January 5			3,000 @ $8.00 =	$24,000	3,000 @ $8.00	$24,000
January 10	5,000 @ $9.00 =	$45,000			3,000 @ $8.00 5,000 @ $9.00	$69,000
January 12			2,000 @ $8.00 =	$16,000	1,000 @ $8.00 5,000 @ $9.00	$53,000
January 18	6,000 @ $10.00 =	$60,000			1,000 @ $8.00 5,000 @ $9.00 6,000 @ $10.00	$113,000
January 20			1,000 @ $8.00 = 3,000 @ $9.00 =	$ 8,000 $27,000	2,000 @ $9.00 6,000 @ $10.00	**$78,000** *Ending inventory*
	Total cost of goods sold		=	**$75,000**		

4. Average cost, periodic system

Cost of goods available for sale (17,000 units) $153,000
Less: Ending inventory (below)   (72,000)
   Cost of goods sold $ 81,000

Cost of ending inventory:

$$\text{Weighted-average unit cost} = \frac{\$153,000}{17,000 \text{ units}} = \$9.00$$

8,000 units $\times$ $9.00 = $72,000

Alternatively, cost of goods sold could be determined by multiplying the units sold by the average cost: 9,000 units $\times$ $9.00 = $81,000.

Problem 8–5 (concluded)

5. Average cost, perpetual system

Date	Purchased	Sold	Balance
Beginning inventory	6,000 @ $8.00 = $48,000		6,000 @ $8.00 $48,000
January 5		3,000 @ $8.00 = $24,000	3,000 @ $8.00 $24,000
January 10	5,000 @ $9.00 = $45,000		
Available	$\dfrac{\$69,000}{8,000 \text{ units}} = \$8.625/\text{unit}$		
January 12		2,000 @ $8.625 = $17,250	6,000 @ $8.625 $51,750
January 18	6,000 @ $10.00 = $60,000		
Available	$\dfrac{\$111,750}{12,000 \text{ units}} = \$9.3125/\text{unit}$		
January 20		4,000 @ $9.3125 = $37,250	8,000 @ $9.3125 **$74,500** *Ending inventory*
	Total cost of goods sold	= **$78,500**	

Problem 8–6

Requirement 1

Cost of goods available for sale for periodic system:

Purchases:

5,000 × $4.00	$20,000
12,000 × $4.50	54,000
17,000 × $5.00	85,000
Cost of goods available (34,000 units)	$159,000

a. FIFO

Cost of goods available for sale (34,000 units)			$159,000
Less: Ending inventory (determined below)			(70,000)
Cost of goods sold			$ 89,000

Cost of ending inventory:

Date of purchase	Units	Unit cost	Total cost
March 22	14,000	$5.00	$70,000

b. LIFO

Cost of goods available for sale (34,000 units)			$159,000
Less: Ending inventory (determined below)			(60,500)
Cost of goods sold			$ 98,500

Cost of ending inventory:

Date of purchase	Units	Unit cost	Total cost
Jan. 7	5,000	$4.00	$20,000
Feb. 16	9,000	4.50	40,500
Totals	14,000		$60,500

Problem 8–6 (concluded)

c. Average cost

Cost of goods available for sale (34,000 units) $159,000
Less: Ending inventory (below)   (65,471)
  Cost of goods sold $ 93,529*

Cost of ending inventory:

$$\text{Weighted-average unit cost} \ = \ \frac{\$159,000}{34,000 \text{ units}} = \$4.6765$$

14,000 units × $4.6765 = $65,471

* Alternatively, could be determined by multiplying the units sold by the average cost: 20,000 units × $4.6765 = $93,530 (rounding)

Gross Profit ratio:

FIFO: $51,000* ÷ $140,000** = **36%**

LIFO: $41,500* ÷ $140,000** = **30%**

Average: $46,471* ÷ $140,000** = **33%**

*Sales less cost of goods sold
**20,000 units × $7 sales price = sales

Requirement 2

In situations when costs are rising, LIFO results in a higher cost of goods sold and, therefore, a lower gross profit ratio than FIFO. The gross profit ratio using the average cost method falls between that of FIFO and LIFO.

Problem 8–7

Requirement 1

Beginning inventory ($60,000 + $60,000 + $63,000)		$183,000	
Purchases:			
211	$63,000		
212	63,000		
213	64,500		
214	66,000		
215	69,000		
216	70,500		
217	72,000		
218	72,300		
219	75,000	615,300	
Cost of goods available		798,300	
Ending inventory:			
213	$64,500		
216	70,500		
219	75,000	(210,000)	
Cost of goods sold		$588,300	

Requirement 2

Cost of goods available for sale	$798,300
Less: Ending inventory (below)	(219,300)
Cost of goods sold	$579,000

Cost of ending inventory (3 autos):

Car ID	Cost
219	$ 75,000
218	72,300
217	72,000
Total	$219,300

Problem 8–7 (concluded)

Requirement 3

Cost of goods available for sale $798,300
Less: Ending inventory (below)   (183,000)
     Cost of goods sold $615,300

Cost of ending inventory (3 autos):

Car ID	Cost
203	$ 60,000
207	60,000
210	63,000
Total	$183,000

Requirement 4

Cost of goods available for sale (12 units) $798,300
Less: Ending inventory (below)   (199,575)
     Cost of goods sold $598,725*

Cost of ending inventory:

$$\text{Weighted-average unit cost} = \frac{\$798,300}{12 \text{ units}} = \$66,525$$

3 units $\times$ $66,525 = $199,575

* Alternatively, could be determined by multiplying the units sold by the average cost: 9 units $\times$ $66,525 = $598,725

Problem 8–8

Requirement 1

The note indicates that if the company had used FIFO, inventory would have been higher by $2,086 million and $2,009 million at the end of 2019 and 2018, respectively. The increase in the difference between LIFO and FIFO means there was a increase in the LIFO reserve in 2019. The increase in the LIFO reserve increased cost of goods sold by $77 million under LIFO. Therefore, we reverse this and subtract this amount from LIFO cost of goods sold to determine FIFO cost of goods sold of **$36,553 million** ($36,630 million − $77 million).

Requirement 2

Because cost of goods sold would have been lower by $77 million if FIFO had been used, income before taxes under FIFO would have been **higher by $77 million**.

Requirement 3

The information might be useful to a financial analyst interested in comparing Caterpillar's performance with another company using the FIFO inventory method exclusively.

Problem 8–9

Requirement 1

Beginning inventory	$ 450,000
Purchases:	
30,000 units @ $25	750,000
Cost of goods available for sale	1,200,000
Less: Ending inventory (below)	(250,000)
Cost of goods sold	$ 950,000

Cost of ending inventory:

Date of purchase	Units	Unit cost	Total cost
Beg. Inv.	10,000	$15	$150,000
Beg. Inv.	5,000	20	100,000
Totals	15,000		$250,000

Requirement 2

Cost of goods sold assuming all units purchased at the year 2024 price:

40,000 units × $25.00 =	$1,000,000
Less: LIFO cost of goods sold	(950,000)
LIFO liquidation profit before tax	50,000
Multiplied by 1 – 0.25	× 0.75
LIFO liquidation profit	$ 37,500

Requirement 3

$50,000* × 25% = $12,500

* ($25 − $20) × 10,000 units = $50,000 additional reported for cost of goods sold.

Problem 8–10

Requirement 1

Cost of goods sold:

2024:			
	1,000 × $16 =	$ 16,000	
	10,000 × $18 =	180,000	
	11,000	**$196,000**	

2025:			
	1,500 × $16 =	$ 24,000	
	13,000 × $18 =	234,000	
	14,500	**$258,000**	

2026:			
	1,000 × $12 =	$ 12,000	
	12,000 × $18 =	216,000	
	13,000	**$228,000**	

Requirement 2

LIFO liquidation before-tax profit or loss:

2024:	1,000 units × $2 ($18 – $16) =	$2,000 profit
2025:	1,500 units × $2 ($18 – $16) =	$3,000 profit
2026:	1,000 units × $6 ($18 – $12) =	$6,000 profit

Requirement 3

Disclosure note:

During fiscal 2026, 2025, and 2024, inventory quantities in certain LIFO layers were reduced. These reductions resulted in a liquidation of LIFO inventory quantities carried at lower costs prevailing in prior years as compared with the cost of fiscal 2026, 2025, and 2024 purchases. As a result, cost of goods sold decreased by $6,000, $3,000, and $2,000 in fiscal 2026, 2025, and 2024, respectively, and net income increased by approximately $4,500, $2,250, and $1,500, respectively.

Problem 8–11

Requirement 1

Sales (27,000 units × $2,000)	$54,000,000
Less: Cost of goods sold (27,000 units × $1,000)	(27,000,000)
Gross profit	**$27,000,000**

Gross profit ratio = $27,000,000 ÷ $54,000,000 = **50%**

Requirement 2

Sales (27,000 units × $2,000)	$54,000,000
Less: Cost of goods sold*	(25,000,000)
Gross profit	**$29,000,000**

Gross profit ratio = $29,000,000 ÷ $54,000,000 = **53.7%**

*Cost of goods sold:

15,000	units × $1,000 =		$15,000,000
6,000	units × $ 900 =		5,400,000
4,000	units × $ 800 =		3,200,000
2,000	units × $ 700 =		1,400,000
27,000	units		$25,000,000

Problem 8–11 (concluded)

Requirement 3

The gross profit and gross profit ratio are higher applying the requirement 2 assumption of 15,000 units purchased because of the LIFO liquidation profit that results. When inventory quantity declines during a reporting period, LIFO inventory layers carried at costs prevailing in prior years are "liquidated" or assumed sold in the cost of goods sold calculation. This results in noncurrent costs being matched with current selling prices. If the company had purchased at least 27,000 units during 2025, there would be no LIFO liquidation.

The profit difference ($2,000,000 in this case), if material, must be disclosed in a note. The difference can be arrived at by comparing the current replacement cost of $1,000 with each inventory layer from prior years that was included in this year's cost of goods sold, as follows:

6,000 units × $100 ($1,000 – $900)	$ 600,000
4,000 units × $200 ($1,000 – $800)	800,000
2,000 units × $300 ($1,000 – $700)	600,000
Total LIFO liquidation profit	$2,000,000

Requirement 4

Sales (27,000 units × $2,000)		$54,000,000
Cost of goods sold:		
5,000 units × $700	$ 3,500,000	
4,000 units × $800	3,200,000	
6,000 units × $900	5,400,000	
12,000 units × $1,000	12,000,000	24,100,000
27,000 units		

Gross profit   =   **$29,900,000**

Gross profit ratio = $29,900,000 ÷ $54,000,000 = **55.4%**

If only 15,000 units are purchased, cost of goods sold, gross profit, and the gross profit ratio would be exactly the same as when 28,000 units are purchased.

Requirement 5

The number of units purchased has no effect on FIFO cost of goods sold. When applying the first-in, first-out approach, beginning inventory costs are included in cost of goods sold first, regardless of the quantities of inventory purchased in the new reporting period.

Problem 8–12

Requirement 1

Allowance for uncollectible accounts

Balance, beginning of year	$7
Add: Bad debt expense for 2024	8
Less: End-of-year balance	(10)
Accounts receivable written off	**$ 5**

Requirement 2

Accounts receivable analysis:

Balance, beginning of year ($583 + 7)	$ 590
Add: Credit sales	6,255
Less: write-offs (from Requirement 1)	(5)
Less: Balance end of year ($703 + 10)	(713)
Cash collections	**$6,127**

Requirement 3

Cost of goods sold for 2024 would have been **$130 million lower** had Inverness used the average cost method for its entire inventory. While beginning inventory would have been $350 million higher, ending inventory also would have been higher by $480 million. An increase in beginning inventory causes an increase in cost of goods sold, but an increase in ending inventory causes a decrease in cost of goods sold. Purchases for the year are the same regardless of the inventory valuation method used. Therefore, cost of goods sold would have been **$5,060** ($5,190 – 130).

Requirement 4

a. Receivables turnover ratio $= \dfrac{\$6,255}{(\$703 + \$583)/2} =$ **9.73 times**

b. Inventory turnover ratio $= \dfrac{\$5,190}{(\$880 + \$808)/2} =$ **6.15 times**

c. Gross profit ratio $= \dfrac{(\$6,255 - \$5,190)}{\$6,255} =$ **17%**

Problem 8–12 (concluded)

Requirement 5

If inventory costs are increasing, when inventory quantity declines during a period, liquidation of LIFO inventory layers carried at lower costs prevailing in prior year's results in noncurrent costs being matched with current selling prices. The "income" generated by this liquidation is known as LIFO liquidation profit.

The liquidation caused 2024 cost of goods sold to be lower by $8 million [$6 million ÷ (1 – 0.25)]

Problem 8–13

Date	Ending Inventory at Base Year Cost	Inventory Layers at Base Year Cost	Inventory Layers Converted to Cost				Ending Inventory DVL Cost
1/1/2024	$\dfrac{\$400,000}{1.00} = \$400,000$	$400,000 (base)	$400,000	× 1.00 =	$400,000		**$400,000**
12/31/2024	$\dfrac{\$441,000}{1.05} = \$420,000$	$400,000 (base) $20,000 (2024)	$400,000 $20,000	× 1.00 = × 1.05 =	$400,000 21,000		**421,000**
12/31/2025	$\dfrac{\$487,200}{1.12} = \$435,000$	$400,000 (base) $20,000 (2024) $15,000 (2025)	$400,000 $20,000 $15,000	× 1.00 = × 1.05 = × 1.12 =	$400,000 $21,000 $16,800		**437,800**
12/31/2026	$\dfrac{\$510,000}{1.20} = \$425,000$	$400,000 (base) $20,000 (2024) $5,000 (2025)	$400,000 $20,000 $5,000	× 1.00 = × 1.05 = × 1.12 =	$400,000 $21,000 $5,600		**426,600**

Problem 8–14

Date	Ending Inventory at Base Year Cost	Inventory Layers at Base Year Cost	Inventory Layers Converted to Cost				Ending Inventory DVL Cost
1/1/2024	$\dfrac{\$150,000}{1.00} = \$150,000$	$150,000 (base)	$150,000	× 1.00 =	$150,000		**$150,000**
12/31/2024	$\dfrac{\$200,000}{1.08} = \$185,185$	$150,000 (base) $35,185 (2024)	$150,000 $35,185	× 1.00 = × 1.08 =	$150,000 $38,000		**188,000**
12/31/2025	$\dfrac{\$245,700}{1.17} = \$210,000$	$150,000 (base) $35,185 (2024) $24,815 (2025)	$150,000 $35,185 $24,815	× 1.00 = × 1.08 = × 1.17 =	$150,000 $38,000 $29,034		**217,034**
12/31/2026	$\dfrac{\$235,980}{1.14} = \$207,000$	$150,000 (base) $35,185 (2024) $21,815 (2025)	$150,000 $35,185 $21,815	× 1.00 = × 1.08 = × 1.17 =	$150,000 $38,000 $25,524		**213,524**
12/31/2027	$\dfrac{\$228,800}{1.10} = \$208,000$	$150,000 (base) $35,185 (2024) $21,815 (2025) $1,000 (2027)	$150,000 $35,185 $21,815 $1,000	× 1.00 = × 1.08 = × 1.17 = × 1.10 =	$150,000 $38,000 $25,524 $1,100		**214,624**

Problem 8–15

Date	Ending Inventory at Base Year Cost	Inventory Layers at Base Year Cost	Inventory Layers Converted to Cost				Ending Inventory DVL Cost
1/1/2024	$\dfrac{\$260,000}{1.00} = \$260,000$	$260,000 (base)	$260,000	× 1.00 =	$260,000		**$260,000**
12/31/2024	$\dfrac{\$340,000}{1.02} = \$333,333$	$260,000 (base) 73,333 (2024)	$260,000 73,333	× 1.00 = × 1.02 =	$260,000 74,800		**334,800**
12/31/2025	$\dfrac{\$350,000}{1.06} = \$330,189$	$260,000 (base) 70,189 (2024)	$260,000 $70,189	× 1.00 = × 1.02 =	$260,000 71,593		**331,593**
12/31/2026	$\dfrac{\$400,000}{1.07} = \$373,832$	$260,000 (base) $70,189 (2024) $43,643 (2026)	$260,000 $70,189 $43,643	× 1.00 = × 1.02 = × 1.07 =	$260,000 $71,593 $46,698		**378,291**
12/31/2027	$\dfrac{\$430,000}{1.10} = \$390,909$	$260,000 (base) $70,189 (2024) $43,643 (2026) $17,077 (2027)	$260,000 $70,189 $43,643 $17,077	× 1.00 = × 1.02 = × 1.07 = × 1.10 =	$260,000 $71,593 $46,698 $18,785		**397,076**

Problem 8–16

Date	Ending Inventory at Base Year Cost	Inventory Layers at Base Year Cost	Inventory Layers Converted to Cost			Ending Inventory DVL Cost
1/1/2024	$\dfrac{\$84,000}{1.00} = \$84,000$	$84,000 (base)	$84,000	× 1.00 =	$84,000	$84,000
12/31/2024	$\dfrac{\$100,800}{1.05} = \$96,000$	$84,000 (base) $12,000 2024)	$84,000 $12,000	× 1.00 = × 1.05 =	$84,000 $12,600	**96,600**
12/31/2025	$\dfrac{\$136,800}{1.14} = \mathbf{\$120,000}$	$84,000 (base) $12,000 (2024) $24,000 (2025)	$84,000 $12,000 $24,000	× 1.00 = × 1.05 = × 1.14 =	$84,000 $12,600 $27,360	**123,960**
12/31/2026	$\dfrac{\$150,000}{\mathbf{1.20\,(1)}} = \$125,000$	$84,000 (base) $12,000 (2024) $24,000 (2025) $5,000 (2026)	$84,000 $12,000 $24,000 $5,000	× 1.00 = × 1.05 = × 1.14 = × 1.20 =	$84,000 $12,600 $27,360 $6,000	**129,960**
12/31/2027	$\dfrac{\mathbf{\$160,000(5)}}{1.25} = \mathbf{\$128,000(4)}$	$84,000 (base) $12,000 (2024) $24,000 (2025) $5,000 (2026) $3,000 (2027)	$84,000 $12,000 $24,000 $5,000 $3,000**(3)**	× 1.00 = × 1.05 = × 1.14 = × 1.20 = × 1.25 =	$84,000 $12,600 $27,360 $6,000 $3,750**(2)**	133,710

(1) $150,000 ÷ $125,000 = 1.20 (2026 cost index)
(2) $133,710 – $129,960 = $3,750
(3) $3,750 ÷ 1.25 = $3,000
(4) $125,000 + $3,000 = $128,000 (2027 inventory at base-year cost)
(5) $128,000 × 1.25 = $160,000 (2027 inventory at year-end costs)