

Chapter Review Problems

For all problems, do not round dollar amounts to the nearest penny until the final answer is obtained.

Unit 5.1 Trade discounts

For Problems 1 and 2 determine the trade discount amount and the net price.

	Product	List price	Trade discount rate	Trade discount amount	Net price
1.	Computer	\$1,200	30%	$\$1,200 \times 30\% = \360	$\$1,200 - \$360 = \$840$
2.	Copy machine	\$700	25%	$\$700 \times 25\% = \175	$\$700 - \$175 = \$525$

For Problems 3 and 4 find the net price using the complement of the trade discount rate.

	Product	List price	Trade discount rate	Complement of rate	Net price
3.	Computer	\$1,200	30%	$100\% - 30\% = 70\%$	$\$1,200 \times 70\% = \840
4.	Copy machine	\$700	25%	$100\% - 25\% = 75\%$	$\$700 \times 75\% = \525

5. Compare net prices: Problem 1 with Problem 3, and Problem 2 with Problem 4 **Answers are the same, confirming both approaches work.**
6. Santiago Gonzalez, an appliance dealer, can buy a big-screen TV at a list price of \$6,400 with a 25/10/10 series discount. Find the net price by calculating the price after each discount.

List price	\$6,400
First discount: $\$6,400 \times 25\%$	<u>-1,600</u>
Price after first discount	\$4,800
Second discount: $\$4,800 \times 10\%$	<u>- 480</u>
Price after second discount	\$4,320
Third discount: $\$4,320 \times 10\%$	<u>- 432</u>
Net price	\$3,888

7. Refer to Problem 6. Determine the equivalent single discount rate.

Step 1 (complements)	Step 2 (multiply complements)	Step 3 (complement of Step 2)
25% 10% 10%	$75\% \times 90\% \times 90\%$	100.00%
↓ ↓ ↓	$= .75 \times .90 \times .90$	<u>-60.75%</u>
75% 90% 90%	$= .6075$	39.25%
	$= 60.75\%$	

8. Refer to Problem 7. What is the significance of the equivalent single discount rate? **It means that a 39.25% single discount is identical to a 25/10/10 series discount.**
9. Refer to Problems 6 and 7. Find the net price using the equivalent single discount rate from Problem 7.

List price	\$6,400
Trade discount: $\$6,400 \times 39.25\%$	<u>-2,512</u>
Net price	\$3,888

10. Josh Bradford is a cabinet wholesaler. He decides to sell a new product. If he needs to net \$600 after trade discounts and offers most customers a 30% trade discount, what should the list price be?

$$\text{List price} = \frac{\text{Net price}}{\text{Complement of trade discount rate}} = \frac{\$600}{70\%} = \frac{\$600}{.70} = \mathbf{\$857.14}$$

11. Using the list price found in Problem 10, determine whether the 30% trade discount results in the desired net price of \$600.

List price	\$857.14
Trade discount: $\$857.14 \times 30\%$	<u>-257.14</u>
Net price	\$600.00

12. Juan Rodriguez is a furniture wholesaler. He decides to sell a new product—a leather sofa. If he needs to net \$2,100 after trade discounts and offers most customers a 20/10/5 series discount, what should the list price be?

Step 1 (complements) Step 2 (multiply complements)

$$\begin{array}{r}
 20\% \quad 10\% \quad 5\% \\
 \downarrow \quad \downarrow \quad \downarrow \\
 80\% \quad 90\% \quad 95\%
 \end{array}
 \qquad
 \begin{array}{l}
 80\% \times 90\% \times 95\% \\
 = .80 \times .90 \times .95 \\
 = .684 \\
 = 68.4\%
 \end{array}$$

$$\text{List price} = \frac{\text{Net price}}{\text{Complement of equivalent single discount rate}} = \frac{\$2,100}{68.4\%} = \frac{\$2,100}{.684} = \mathbf{\$3,070.18}$$

13. Using the list price found in Problem 12, determine if the 20/10/5 series discount results in the desired net price of \$2,100.

List price	\$3,070.18
First discount: $\$3,070.18 \times 20\%$	<u>- 614.04</u>
Price after first discount	\$2,456.14
Second discount: $\$2,456.14 \times 10\%$	<u>- 245.61</u>
Price after second discount	\$2,210.53
Third discount: $\$2,210.53 \times 5\%$	<u>- 110.53</u>
Net price	\$2,100.00

Unit 5.2 Cash discounts

14. You buy goods with a list price of \$800. You return goods that are defective, having a list price of \$50. You are entitled to a trade discount of 20%. The seller paid \$20 in freight on your behalf and added the amount to the invoice. You are offered a 4% cash discount if you pay the invoice within 15 days. What is the net amount you should pay the supplier if you make payment within the discount period?

List price	\$800.00
Less returned goods	<u>- 50.00</u>
Price of goods after returns	\$750.00
Less trade discount: $\$750 \times 20\%$	<u>- 150.00</u>
Net price	\$600.00
Less cash discount: $\$600 \times 4\%$	<u>- 24.00</u>
Net price, less cash discount	\$576.00
Add freight	<u>+ 20.00</u>
Net amount due	\$596.00

15. You purchase goods with a net price of \$240. The invoice is dated October 7 with terms of 3/20, n/45. Determine (a) the cash discount, (b) the net amount due if paid within the discount period, (c) the last day of the discount period, and (d) the last day of the credit period.

- a. Cash discount: $\$240 \times 3\% = \mathbf{\$7.20}$
 b. Net amount due: $\$240 - \$7.20 = \mathbf{\$232.80}$
 c. Last day of discount period: October 7 + 20 = **October 27**
 d. Last day of credit period: October 7 is day 280; $280 + 45 = 325$. Day 325 is **November 21**.

16. An invoice for \$75.20 has terms of 3/10, 1/30, n/60. If you make payment 25 days after the invoice date, what amount should you pay? Discount = $\$75.20 \times 1\% = \0.75 ; net amount due = $\$75.20 - \$0.75 = \mathbf{\$74.45}$

17. You purchase goods on an invoice dated July 5 with terms of 4/15, n/45 ROG. If you receive the goods on July 23, calculate (a) the last day of the discount period, and (b) the last day of the credit period.

- a. Last day of discount period: The credit period begins on July 23, the date the goods were received. July 23 is day 204; $204 + 15 = 219$; day 219 is **August 7**.
 b. Last day of credit period: $204 + 45 = 249$; day 249 is **September 6**.

18. You purchase goods on an invoice dated July 27 with terms of 3/10 EOM. Determine (a) the last day of the discount period, and (b) the last day of the credit period.

- a. Last day of discount period: The credit period does not begin until the last day of August (because the invoice is dated after the 25th of the month). The last day of the discount period is 10 days beyond August 31, which is **September 10**.
 b. The last day of credit period: Because the invoice does not specify when the credit period ends, we assume the credit period extends 20 days past the last day of the discount period, which is **September 30**.

19. You purchase goods on an invoice dated February 5 of a leap year, with terms of 5/10-90X. Calculate the last day of the discount period. The discount period ends 100 days (10 + 90 = 100) after the date of the invoice. February 5 is day 36. The last day of the discount period is day 136 (36 + 100 = 136). Day 136 is **May 15** (remember, because the year is a leap year, 1 must be added to each day after February 28: so May 16 is day 137 and May 15 is day 136).
20. You receive an invoice for \$18,300 with terms of 3/15, n/60. If the supplier has a policy of allowing a cash discount for partial payments and you pay \$10,000 within the discount period, calculate the amount of credit you will receive for this payment.

$$\text{Amount credited} = \frac{\text{Amount paid}}{\text{Complement of cash discount rate}} = \frac{\$10,000}{100\% - 3\%} = \frac{\$10,000}{97\%} = \frac{\$10,000}{.97} = \$10,309.28$$

21. For terms of 6/10, n/30, what annual rate do you pay the supplier if you fail to pay the invoice at the end of the discount period?

$$\frac{6}{94} \times \frac{365}{30-10} = \frac{6}{94} \times \frac{365}{20} = \frac{6 \times 365}{94 \times 20} = \frac{2,190}{1,880} \approx 1.1649 \approx 116.49\%$$

Challenge problems

22. Which type of discount (trade discount or cash discount) is given as an incentive to pay the seller promptly? **Cash discount**
23. Series discounts are a form of trade discount. (T or F) **True**
24. Trade discounts are given only if the invoice is paid during the discount period. (T or F) **False** Trade discounts are given as an incentive to buy the product, regardless of whether the invoice is paid within the discount period.
25. You can buy a product from one of three companies. Company A for \$3,200 with a trade discount of 30%, Company B for \$2,900 with a trade discount of 20/10, or Company C for \$3,450 with a trade discount of 20/15/5. Which company has the lowest net price?

Company A: $\$3,200 - 30\%(\$3,200) = \$2,240.00$

Company B: $\$2,900 - 20\%(\$2,900) = \$2,320$; $\$2,320 - 10\%(\$2,320) = \$2,088.00$

Company C: $\$3,450 - 20\%(\$3,450) = \$2,760$; $\$2,760 - 15\%(\$2,760) = \$2,346$; $\$2,346 - 5\%(\$2,346) = \$2,228.70$

For Problems 26–28 calculate the net price and net amount due (assuming the invoice is paid within the discount period).

	Product	List price	Trade discount rate	Net price	Cash discount	Net amount due
26.	Computer	\$1,200	30%	\$840.00	2%	\$823.20
27.	Copy machine	\$700	30/10	\$441.00	8%	\$405.72
28.	Desk	\$800	25/15/5	\$484.50	4%	\$465.12

For Problems 29–33 assume that you purchase goods with a list price of \$455 and a trade discount of 25%. The invoice is dated October 3 with terms of 3/15, n/45.

29. What is the net price after trade discount?

$$\begin{array}{r} \text{List price} & \$455.00 \\ \text{Trade discount amount: } \$455 \times 25\% & \underline{-113.75} \\ \text{Net price} & \mathbf{\$341.25} \end{array}$$

30. What is the last day you can take a cash discount? **October 3 + 15 = October 18**

31. What is the net amount due if you pay within the discount period?

$$\begin{array}{r} \text{Net price} & \$341.25 \\ \text{Cash discount: } \$341.25 \times 3\% & \underline{-10.24} \\ \text{Net amount due} & \mathbf{\$331.01} \end{array}$$

32. If you do not pay within the discount period, what is the final date to pay the invoice? **October 3 is day number 276; 276 + 45 = 321. Day 321 is November 17.**

33. If you do not pay within the discount period, what annual interest rate are you, in effect, paying the supplier? Express the rate with two decimal places.

$$\frac{3}{97} \times \frac{365}{45-15} = \frac{3}{97} \times \frac{365}{30} = \frac{3 \times 365}{97 \times 30} = \frac{1,095}{2,910} \approx .3763 \approx 37.63\%$$

Practice Test

1. Amber is an appliance dealer. She can buy a freezer for a list price of \$820 with 25% trade discount. What is Amber's net price?

List price	\$820.00
Trade discount amount: $\$820 \times 25\%$	<u>-205.00</u>
Net price	\$615.00

2. Sean is a carpet retailer. He can buy carpet from a wholesaler for a list price of \$22 per yard. If Sean receives a series discount of 20/10, what is his net price?

List price	\$22.00
First discount: $\$22 \times 20\%$	<u>- 4.40</u>
Price after first discount	\$17.60
Second discount: $\$17.60 \times 10\%$	<u>- 1.76</u>
Net price	\$15.84

3. For the last 15 years, Tina has been receiving a 20/15/5 series discount. Find the equivalent single discount rate.

Step 1 (complements)	Step 2 (multiply complements)	Step 3 (complement of Step 2)
20% 15% 5%	$80\% \times 85\% \times 95\%$	100.0%
↓ ↓ ↓	$= .80 \times .85 \times .95$	<u>- 64.6%</u>
80% 85% 95%	$= .646$	35.4%
	$= 64.6\%$	

4. A-1 Company decides to introduce a new product. If A-1 needs to net \$800 after trade discounts, and offers most customers a 30/10/5 series discount, what should the list price be?

Step 1 (complements)	Step 2 (multiply complements)
30% 10% 5%	$70\% \times 90\% \times 95\%$
↓ ↓ ↓	$= .70 \times .90 \times .95$
70% 90% 95%	$= .5985$
	$= 59.85\%$

$$\text{List price} = \frac{\text{Net price}}{\text{Complement of equivalent single discount rate}} = \frac{\$800}{.5985} = \frac{\$800}{.5985} = \mathbf{\$1,336.68}$$

5. You buy goods on an invoice dated October 28, with terms of 2/20, n/45. What is the last day of the discount period? **October 28 is day 301; $301 + 20 = 321$. Day 321 is November 17.**
6. You buy goods at a list price of \$820. If you receive a trade discount of 25% and terms are "2/15, n/30," what amount must you pay if you pay within the discount period?

List price	\$820.00
Trade discount: $\$820 \times 25\%$	<u>-205.00</u>
Net price	\$615.00
Cash discount: $\$615 \times 2\%$	<u>- 12.30</u>
Net amount due	\$602.70

7. You receive an invoice for \$18,300 with terms of 5/15, n/60. If the supplier has a policy of allowing a cash discount for partial payments and you pay \$11,500 within the discount period, calculate the amount of credit you will receive for this payment.

$$\text{Amount credited} = \frac{\text{Amount paid}}{\text{Complement of cash discount rate}} = \frac{\$11,500}{100\% - 5\%} = \frac{\$11,500}{.95} = \frac{\$11,500}{.95} = \mathbf{\$12,105.26}$$

8. For terms of 8/10, n/60 determine the annual rate you, in effect, pay the supplier if you fail to pay the invoice at the end of the discount period. Express the rate with 2 decimal places.

$$\frac{8}{92} \times \frac{365}{60-10} = \frac{8}{92} \times \frac{365}{50} = \frac{8 \times 365}{92 \times 50} = \frac{2,920}{4,600} \approx .6348 \approx \mathbf{63.48\%}$$