



Trade & Cash Discount

TRADE DISCOUNT

A **trade discount** is an amount deducted from the list price. It is the product of the discount rate and the list price. The **list price** is the suggested retail price determined by the manufacturer or distributor and listed in their product list or catalogue.

$$\text{Amount of discount} = \text{Rate of discount} \times \text{List price}$$

For example, if a textbook lists for \$40 and is discounted 20%, the discount is:

$$\text{Discount} = 20\% \times \$40 = 0.2 \times 40 = \$8$$

[Hint: Remember to change the percent to a decimal number before multiplying]

The actual or the **net price** is the difference between the list price and the amount of discount. It is also sometimes called the *sale price*.

$$\text{Net price} = \text{List price} - \text{Amount of discount}$$

In the case of the textbook: Net price = \$40 - \$8 = \$32

Example: A pair of jeans that originally cost \$90 is now on sale for 30% off. What is the (a) the amount of discount, and (b) the net price.

Solution: (a) Amount of trade discount = $0.30 \times \$90 = \27

(b) Net price = $\$90 - \$27 = \$63$

Instead of computing the amount of discount and then deducting this amount from the list price, the net price can be found using the *net factor approach*. The **Net Price Factor (NPF)** or net factor can be found using the following formula:

$$\text{Net Price Factor (NPF)} = 100\% - \% \text{ discount}$$

$$\text{NPF} = 1 - d$$

The relationship between net price and list price may be stated generally as:

$$\text{Net Price (N)} = \text{Net Price Factor (NPF)} \times \text{List Price (L)}$$

$$N = (1 - d) \times L \quad \text{or} \quad N = L \times (1 - d)$$



Example: Find the net price for list price \$30 less 30%.

Solution: Net price = $L \times (1 - d) = 30 \times (1 - 0.30) = 30 \times 0.70 = \21

DISCOUNT SERIES (MULTIPLE DISCOUNTS)

Sometimes sales people offer several discounts to entice the customer to buy the product. If a list price is subject to two or more discounts, these discounts are called a **discount series**. The key thing to understand about multiple discounts is that the second and third discounts are not based on the original price. They are based on the already discounted price. The short-cut equation to calculate net price in a discount series is given as:

$$\text{Net Price} = (\text{NPF of 1}^{\text{st}} \text{ discount}) \times (\text{NPF of 2}^{\text{nd}} \text{ discount}) \times \text{List Price}$$

$$N = (1 - d_1) \times (1 - d_2) \times L$$

If there are more than 2 discounts;

$$N = (1 - d_1) \times (1 - d_2) \times (1 - d_3) \dots (1 - d_n) \times L$$

Example: An item listed at \$100 is subject to the discounts of 20%, 10% and 5%. Determine the net price.

Solution: $N = (1 - d_1) (1 - d_2) (1 - d_3) L$
 $N = (1 - 0.2) (1 - 0.1) (1 - 0.05) \times \100
 $N = (0.684) \times \$100 = \68.40

When you are dealing with a series of discounts you almost always want to know what the actual rate of discount really is. This is referred to as the **Single Equivalent Discount (SED)**. The formula to calculate SED is:

$$\text{SED} = 1 - \text{NPF for the discount series}$$

$$\text{SED} = 1 - [(1 - d_1) \times (1 - d_2) \times (1 - d_3) \dots (1 - d_n)]$$

For the discount series in example 3, the $\text{SED} = 1 - 0.684 = 0.316$ or 31.60%



Practice Problems

- A 30% discount on a stereo amounts to \$45.58. Compute the list price and the net price.
- Frank's Décor sells curtains for \$85.85 less 25%. What additional discount percent must the store offer the meet a competitor's price of \$50.65?
- A BBQ grill is listed for \$520.75 less 10%, 5%, 2%.
 - What is the net price?
 - What is the total amount of discount allowed?
 - What is the exact single rate of discount allowed?
- Fill in the blanks for the following categories:

No.	Rates of discounts	List Price	Net Price	SED
a.	10%, 15%	105.60		
b.	33 $\frac{1}{3}$ %, 5%, 7%		54.74	
c.	25%, 10%, 10%, 5%		15.25	

Solutions

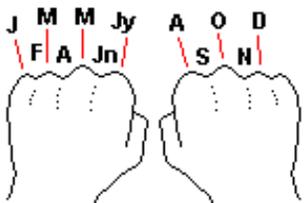
- List Price = $D/d = \$45.58/0.3 = \151.93
Net Price = $L - D = \$151.93 - \$45.58 = \$106.35$
- Net Price = $(1 - d) \times L = 0.75 \times \$85.85 = \$64.39$
Additional discount = $\$64.39 - \$50.65 = \$13.74$
Additional discount percent = $13.74/64.39 = 21.34\%$
- $N = (1 - d_1) (1 - d_2) (1 - d_3) \times L$
 $N = (1 - 0.1) (1 - 0.05) (1 - 0.02) \times \$520.75 = (0.8379) \times \$520.75 = \$436.34$
 - $D = L - N = \$520.75 - \$436.34 = \$84.41$
 - $SED = 1 - [(1 - d_1) (1 - d_2) (1 - d_3)] = 1 - 0.8379 = 0.1621$ or 16.21%
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No.	Rates of discounts	List Price	Net Price	SED
a.	10%, 15%	105.60	80.78	23.5%
b.	33 $\frac{1}{3}$ %, 5%, 7%	92.94	54.74	41.1%
c.	25%, 10%, 10%, 5%	26.42	15.25	42.29%



CASH DISCOUNT

Many manufacturers and wholesalers allow customers to take a cash discount, a reduction of the amount due on an invoice to encourage prompt payment of the bill. Calculating the cash discount can be tricky since you need to know how to count the exact number of days for which the discount is offered. Knowing if a month has 30 or 31 days (or 28 in the case of February) is important. The knuckle method is often useful:



The knuckle months (January, March, May, July, August, October and December) have 31 days. The other months have 30 or fewer days.

There are usually three methods to calculate cash discounts: Ordinary Dating, End of Month (EOM) Dating and Receipt of Goods (ROG) Dating.

Ordinary Dating Method

Many firms offer credit terms 2/10, n/30 (read as “two ten, net thirty”). This means you get a 2% discount if you pay within 10 days of receiving the invoice. You must pay the bill within 30 days or you start to incur interest charges.

Remember: Start counting the days on the **day after** the date on the invoice.

Example: Laura received an invoice of \$3060.50 dated May 31, terms 3/15, n/30. She paid it in full on June 14. What amount did she pay?

Solution:

- Date of invoice : May 31
- Day 1 of the discount period: June 1
- Last day of the discount period: June 15
- Date of payment: June 14 (customer will get a discount)

Use the net price formula from the trade discount calculation.

$$N = (1 - d) \times L$$

$$N = (1 - 0.03) \times 3060.50 = 0.97 \times 3060.50$$

$$N = \$2968.69$$

End of Month Dating Method

Sometimes the sales terms reads 2/10 n/30 E.O.M., where E.O.M. stands for “end of month”. This means you get a 2% discount if you pay within the first 10 days of the next month. You must pay the bill within the first 30 days of the next month or you start to incur interest charges.

Remember: Start counting the days from the **1st day of the next month** after the invoice is received.

Example 5: Newman, Inc. received an invoice for \$1500.65 dated June 05, terms 2/10 E.O.M. The invoice is paid on July 10. What is the amount paid?



<i>Solution:</i>	Date of invoice	June 05
	Day 1 of the discount period	July 1
	Last day of the discount period	July 10
	Date of payment	July 10

Use the net price formula from the trade discount calculation.

$$N = (1 - d) \times L$$

$$N = (1 - 0.02) \times 1500.65 = 0.98 \times 1500.65$$

$$N = \$1470.64$$

Receipt of Goods Dating Method

Many firms issue credit terms based on the day goods are received instead of the invoice date. The terms may be written as 2/10 R.O.G., where R.O.G. stands for “receipt of goods”. This means you get a 2% discount if you pay within the first 10 days after the goods are received.

Remember: Start counting the days **the day after** the goods are received.

Example: DMG, Inc. received an invoice of \$4750 dated January 10, terms 2/10 n/30 R.O.G., for a shipment that arrived on February 05. What is the last day for taking the cash discount?

<i>Solution:</i>	Date of invoice	January 10
	Day 1 of the discount period	February 06
	Last day of the discount period	February 15

PARTIAL PAYMENTS

Most sellers allow buyers to make partial payments and take advantage of the discount terms if the partial payment is made within the time specified in the credit terms. When this happens, the discount terms apply only to the partial payment. Again, use your common sense, when a customer takes advantage of the cash discount, it means they should be credited MORE on their invoice than they actually pay.

Example: Will Simms, Inc. received an invoice of \$15,700 for computer hardware with terms of 4/10, n/30. They sent a cheque for \$5,000 within 10 days of receiving the invoice. What amount was Will Simms, Inc. credited on his invoice? What is the balance owing?

Solution: Since the partial payment was made within the ten days of the invoice date, Will Simms, Inc. will take advantage of the cash discount of 4% on the \$5,000 paid.

Use the net price formula from the trade discount calculation. Here N is the AMOUNT OF CASH ACTUALLY PAID, and L IS THE AMOUNT CREDITED ON THE INVOICE.

$$N = (1 - d) \times L$$

$$5,000 = (1 - 0.04) \times L = 0.96 \times L$$

$$5,000/0.96 = L$$

$$5208.33 = L$$

They receive a credit for 5208.33 on their invoice, so the balance remaining is
 $15,700 - 5208.33 = \$10491.67$



Practice Problems

1. Fill in the blanks with the first and last day of the discount period.

No.	Payment Terms	Date of Invoice	Date Goods received	First day of discount period	Last day of discount period
a.	2/10, n/30	January 31	January 31		
b.	3/15, n/60 E.O.M	June 20	June 29		
c.	5/10, 2/20 R.O.G	May 21	July 03		

2. A check of \$1581.00 was received on June 12 in full payment of an invoice dated June 06, terms 7/10, n/30. What was the net amount of the invoice?
3. Lombard Tennis Ltd. received an invoice dated April 15 from Wimbledon Importers with terms 5/15, n/60 R.O.G for: 50 Tennis rackets at \$130.65 each; 500 Tennis Balls at \$10.50 each and 130 wristbands for \$20.75 each. All items are subject to trade discount of 30% regardless of the payment method.
- If the shipment was received on May 24, what is the last day for payment to get a discount?
 - What is the amount due if the invoice was paid in full on June 05?
 - Ignore parts (a) and (b). If a partial payment is made on the last day of the discount period to reduce the invoice balance to \$5,000, what is the amount of the payment?

Solutions

1.

No.	Payment Terms	Date of Invoice	Date Goods received	First day of discount period	Last day of discount period
a.	2/10, n/30	January 31	January 31	February 01	February 10
b.	3/15, n/60 E.O.M	June 20	June 29	July 01	July 15
c.	5/10, 2/10, R.O.G	May 21	July 03	July 04	July 23

2. Since the payment was made before the last day of the discount period, the purchaser was entitled for a 7% cash discount.
 Amount paid = $(1 - d) \times \text{Amount of invoice}$
 Amount of invoice = $\text{Amount paid} / (1 - d) = 1581.00 / .93 = \1700.00
3. (a) Last day of Payment = June 08
 (b) Total cost of items = $(50 \times 130.65) + (500 \times 10.50) + (130 \times 20.75) = \$14,480$
 Net Price after discount = $(1 - 0.3) \times \$14,480 = \$10,136$
 Amount due on June 05 = $(0.95) \times \$10,136 = \9629.20
 (c) Partial Payment Credit = $\$10,136 - \$5000 = \$5,136$
 Amount paid = $(0.95) \times \$5,136 = \4879.20

