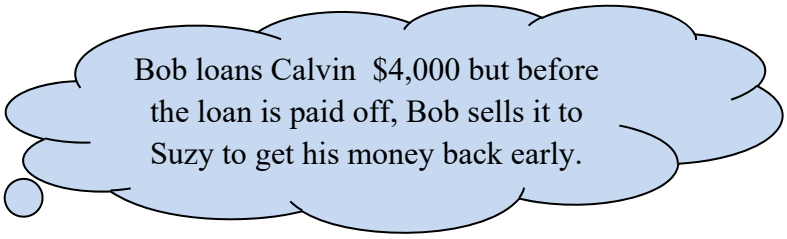


Business Mathematics
Class notes
Discounting a Note Before Maturity (section 9.4)

A person or bank buys a note (in other words, loans someone money) as in the previous sections. It could be a simple interest or simple discount note. Before it is repaid, the lender sells the note to a third party to get their money back early (minus a bit). This is called **discounting a note**. Technically, this means finding the value of the note on a specific date before it matures.

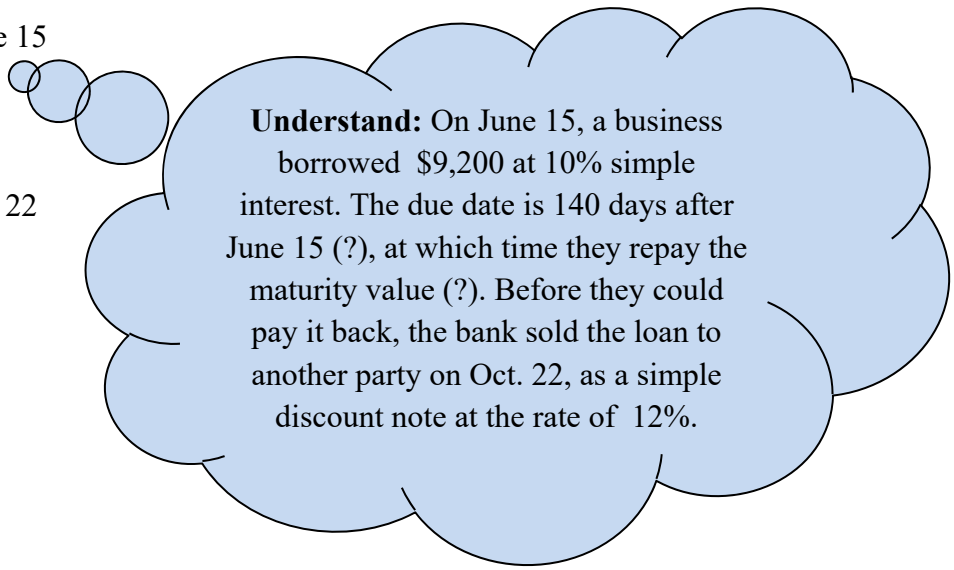
Again, we can do this for simple interest or simple discount notes. The procedures are similar but differ slightly. The two steps, in general, are below.

Calculate the Proceeds When Discounting a Note:
1. Understand the note. **If it's a simple interest note,** find the due date and maturity value of the original note. **If it's a simple discount note,** find the due date and maturity value as well as the discount and proceeds of the original note.

2. Discount the note. We'll find the **discount period (T)**, which is the time from the sale of the note to the maturity date. We will find the **discount (B)** using the formula $B = M \times D \times T$. From there, find the **proceeds**, or the amount needed for the third party to buy the note, using the formula $P = M - B$.

expl 1: Find the maturity value of this simple *interest* note. This note is then discounted at 12% (and sold). Find the discount period, the discount, and the proceeds after discounting.

Date Loan was Made: June 15
Face Value: $9,200
Length of Loan: 140 days
Rate (original loan): 10%
Date of Discount: October 22



Do your work on the next page.

Let's get to work! We'll work it out step-by-step.

expl 1 (continued): Find the maturity value of this simple *interest* note. This note is then discounted at 12% (and sold). Find the discount period, the discount, and the proceeds after discounting.

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Face Value: $9,200
Length of Loan: 140 days
Rate (original loan): 10%
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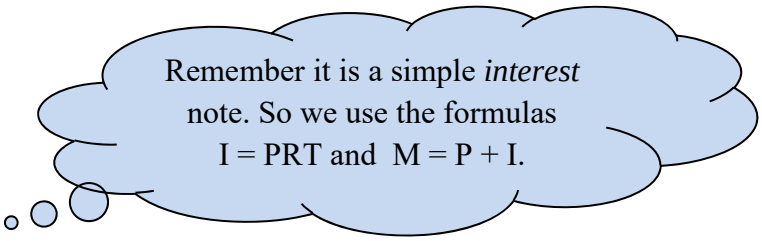
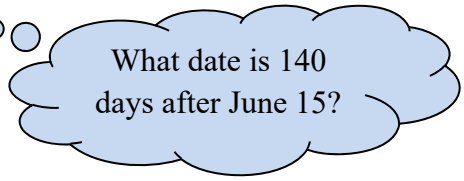
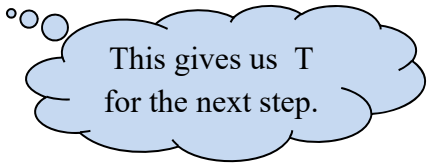


Step 1: Find the due date and maturity value of the original note.

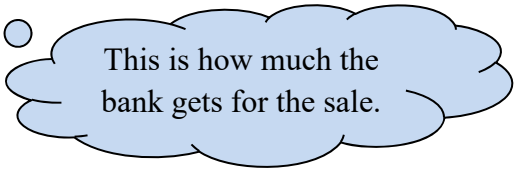


Step 2a: Find the discount period, which is the time from the sale of the note to the maturity date. In other words, how long does the third party own the loan until it is paid off?



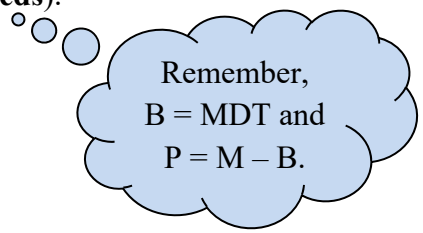
Step 2b: Find the discount (B) using the formula $B = M \times D \times T$.

Step 2c: Find the proceeds using the formula $P = M - B$.

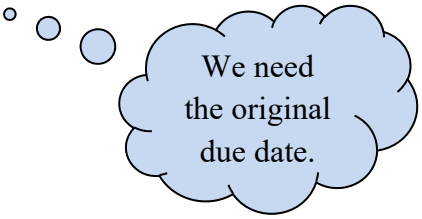


expl 2: Kathy Bates, of Bates Motel and Spa, needs a new set of sensory deprivation tanks and agrees to a 10% simple *discount* note with a maturity value of $18,500 on July 30. The 120-day note is sold by the lender at a 12% discount rate on September 2. Find the following.

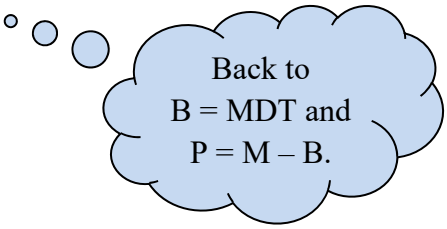
a.) Find the proceeds of the original note to Bates (aka the **initial proceeds**).



b.) Find the discount period (for the sale of the note).



c.) Find the discount for this sale.



d.) Find the proceeds of the sale on September 2. In other words, how much does the bank get for the note when they sell it?

expl 3: Find the effective interest rate, rounded to the nearest hundredth of a percent, for the time the (original) lender held the note in the Kathy Bates example. Follow these steps.

a.) How much did the (original) lender get paid for the note? _____

How much did the (original) lender pay out to Kathy Bates? _____

The difference is the money the lender earned on this note, or their interest. So how much interest did the lender earn? I = _____

b.) How much time did the (original) lender hold the note? In other words, how many days are between July 30 (when Kathy took out the loan) and September 2 (when the lender sold the loan)?

c.) Use the formula $R = \frac{I}{PT}$ to find the effective interest rate, R.