Solution:

$$P = \frac{I}{(r)(t)}$$

$$P = \frac{11.25}{(0.05)(9/12)}$$

$$P = \frac{11.25}{0.0375}$$

Answer: P = $300

- Interest Rate (r) - the ratio of the interest in one unit of time.

$$\boxed{r = \frac{I}{(P)(t)}} \rightarrow \text{annual rate of simple interest}$$

EXAMPLE:

1. Dora invested $30,000 in the stock market which guaranteed an interest of $5,600 after 3 years. At what rate would the investment earn?

Find: r (interest rate) = ?

Given: P = $30,000
I = $5,600
t = 3 years

Solution:

$$r = \frac{5600}{(30000)(3)}$$

$$r = \frac{5600}{90000}$$

$$r = 0.0622$$

Answer: r = 6.22%

→ **INTERVAL BETWEEN DATES:**

<u>* 4 VARIETIES OF INTEREST:</u>

1. Ordinary Interest for Actual
2. Ordinary Interest for Approximate
3. Exact Interest for Actual
4. Exact Interest for Approximate

EXAMPLE:

1. Find the interest using the 4 methods on $50,000 at 5% from April 21, 2018 to October 24, 2018.

Find: D (actual and approx. time) = ?
Io (for actual) = ?
Io (for approx) = ?
Ie (for actual) = ?
Ie (for approx) = ?

Given: P = $50,000
r = 5% (5 / 100) = 0.05

Solution:

MONTH	ACTUAL # OF DAYS	APPROXIMATE # OF DAYS
April → from 21st to end of month	9	9
May → full month	31	30
June → full month	30	30
July → full month	31	30
August → full month	31	30
September → full month	30	30
October → from 1st to 24th	24	24
	186 days	**183 days**

1. Ordinary Interest for Actual

Io = Pr (D / 360)
Io = (50000)(0.05)(186/360)
Io = 1291.67

2. Ordinary Interest for Approximate

Io = Pr (D / 360)
Io = (50000)(0.05)(183/360)
Io = 1270.83

3. Exact Interest for Actual

Ie = Pr (D / 365)
Ie = (50000)(0.05)(186/365)
Ie = 1273.97

4. Exact Interest for Approximate

Ie = Pr (D / 365)
Ie = (50000)(0.05)(183/365)
Ie = 1253.42

Answer: Io (for actual) = 1291.67
Io (for approx) = 1270.83
Ie (for actual) = 1273.97
Ie (for approx) = 1253.42

EXAMPLES:

1. Hyzel borrowed $230,000 at 8¾% bank discount rate for 1 year and 9 months. Find the amount received on the date of the borrowing and the amount payable on the maturity date.

   Find: P (Proceeds/Present Value) = ?
   F (Maturity value) = ?

   Given: money borrowed = $230,000
   d = 8¾% (3/4 = 0.75)
   d = 8.75% (8.75 / 100) = 0.0875
   t = 1 year and 9 months (9/12 = 0.75)
   t = 1.75

   Solution:

   a. Solve for d:

      d = 8¾% (3/4 = 0.75)
      d = 8.75% (8.75 / 100) = 0.0875

   b. Solve for t:

      t = 1 year and 9 months (9/12 = 0.75)
      t = 1.75

   c. Amount received on the date of the borrowing (proceeds/present value):

      P = F [1 - (d)(t)]
      P = 230,000 [1 - (0.0875)(1.75)]
      P = $194,781.25

   d. Amount payable on the maturity date:

$$F = \frac{P}{1 - (d)(t)}$$

$$F = \frac{194{,}781.25}{1 - (0.0875)(1.75)}$$

$$F = \frac{194{,}781.25}{1 - 0.153125}$$

$$F = \frac{194{,}781.25}{0.846875}$$

      F = $230,000

   Answer: P = $194,781.25
   F = $230,000