

FINANCE MATHEMATICS.

①

Do not refer to the formulae in the book.

F-1

Simple Interest

$$F = P(1 + rt)$$

F = Future Value

P = Principal or Present Value

r = simple rate of interest
in decimals

t = years

$$r_{\text{eff}} = \frac{r}{1 - rt}$$

F-2

Compound Interest

$$F = P(1 + i)^n$$
$$= P\left(1 + \frac{r}{m}\right)^{m \cdot t}$$

n = m t is the number
of time period

$\frac{r}{m}$ - interest per period

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$$(2) \quad P = \$2000 \quad r = 8.0\% \quad t = 4 \text{ months} = \frac{1}{3} \text{ years}$$

$$F = P(1 + rt) = 2000 \left(1 + 0.08 \left(\frac{1}{3}\right)\right) = 2053.33$$

$$\text{Int} = F - P = 2053.33 - 2000 = 53.33$$

$$(6) \quad P = \$5000 \quad r = 5.0\% \quad t = 4 \text{ months}, \quad t = \frac{1}{3}$$

$$F = P(1 + rt) = 5000 \left(1 + 0.05 \left(\frac{1}{3}\right)\right) = 5083.33$$

Interest paid = Future Amt - Principal.

$$(10) \quad P = 5000 \quad F = 5200 \quad t = \frac{1}{3}$$

$$5200 = 5000 \left(1 + r \cdot \frac{1}{3}\right)$$

$$1.04 = \left(1 + \frac{r}{3}\right)$$

$$0.04 = \frac{r}{3}$$

$$r = 0.12 \quad r = 12\%$$

(18)

$$r = 0.06$$

$$t = \frac{1}{4} - 3 \text{ months}$$

$$r_{\text{eff}} = \frac{r}{1 - rt} = \frac{0.06}{1 - 0.06 \frac{1}{4}} = 0.0609 = 6.09\%$$

(16)

$$F = \$8000$$

$$r = 0.07$$

$$t = 3 \text{ years}$$

$$F = P(1 + rt)$$

$$8000 = P(1 + 0.07(3))$$

$$P = 6611.57$$

Interest Earned during this period =

$$8000 - 6611.57 = \$1388.43.$$

F.2

$$F = P(1+i)^n = P\left(1 + \frac{r}{m}\right)^{mt}$$

④

② $P = 2000$

$$r = 0.09$$

$$m = 1 \text{ (compounded Annually)}$$

$$t = 1$$

$$F = 2000 \left(1 + \frac{0.09}{1}\right)^{1 \cdot 1} = 2180$$

Compounding period

Annual

m

1

Semi Annual

2

Quarterly

4

Monthly

12

Bi weekly

26

Weekly

52

Daily

365 (366 for leap year)

④ $P = 1000$ $r = 10\%$

(I) annually

$$F = 1000 \left(1 + \frac{0.1}{1}\right)^{1 \cdot 1} = 1100$$

(II) quarterly

$$F = 1000 \left(1 + \frac{0.1}{4}\right)^{4 \cdot 1} = 1103.81$$

(III) monthly

$$F = 1000 \left(1 + \frac{0.1}{12}\right)^{12 \cdot 1} = 1104.71$$

(IV) weekly

$$F = 1000 \left(1 + \frac{0.1}{52}\right)^{52} = 1105.06$$

(V) Daily

$$F = 1000 \left(1 + \frac{0.1}{365}\right)^{365} = 1105.15$$

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