(*) Formular of Simple and Compound Interest

P : Principal invested money.

t : time (year)

r : Interest rate

A : amount of money at the time t

① For simple Interest

$$A = P(1 + rt)$$ (linear in time)

② Compound Interest (once a year)

$$A = P(1 + r)^t$$ (exponential in time)

③ Compound Interest (n times a year)

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

If compound monthly : $n = 12$

quarterly : $n = 4$

weekly : $n = 52$

daily : $n = 365$

If compound infinitely many times a year

(continuous compount)

$$P \left(1 + \frac{r}{n} \right)^{nt} \quad \text{when} \quad n \to \infty$$

$$\downarrow$$

$$P e^{rt} \qquad \text{where} \quad e = 2.71828\ldots\ldots$$