Finance Formulae

Simple Interest

$$I = PRT$$

$I =$ simple interest $R =$ interest rate as a decimal (or fraction)

$P =$ principal $T =$ time periods

e.g. If \$3000 is invested for seven years at 6% p.a. simple interest, how much will it be worth after seven years?

$$I = PRT$$
$$I = (3000)(0.06)(7)$$
$$= 1260$$

$\therefore$ Investment is worth \$4260 after 7 years

Compound Interest

$$A_n = PR^n$$

Note: *general term of a geometric series*

A_n = amount after n time periods P = principal

R = 1 + interest rate as a decimal(or fraction)

n = time periods

Note: *interest rate and time periods must match the compounding time*

e.g. If \$3000 is invested for seven years at 6% p.a, how much will it be worth after seven years if;

a) compounded annually?

$$A_n = PR^n$$
$$A_7 = 3000(1.06)^7$$
$$A_7 = 4510.89$$

$\therefore$ Investment is worth \$4510.89 after 7 years

b) compounded monthly?

$$A_n = PR^n$$
$$A_{84} = 3000(1.005)^{84}$$
$$A_{84} = 4561.11$$

$\therefore$ Investment is worth \$4561.11 after 7 years

Depreciation

$$A_n = PR^n$$

A_n = amount after n time periods P = principal

$R = 1 -$ depreciation rate as a decimal(or fraction)

$n =$ time periods

Note: *depreciation rate and time periods must match the depreciation time*

e.g. An espresso machine bought for \$15000 on 1st January 2001 depreciates at a rate of 12.5%p.a.

a) What will its value be on 1st January 2010?

$$A_n = PR^n$$
$$A_9 = 15000(0.875)^9$$
$$A_9 = 4509.87$$

$\therefore$ Machine is worth \$4509.87 after 9 years

b) During which year will the value drop below 10% of the original cost?

$$A_n = PR^n$$

$$15000(0.875)^n < 1500$$

$$(0.875)^n < 0.1$$

$$\log(0.875)^n < \log 0.1$$

$$n \log 0.875 < \log 0.1$$

$$n > \frac{\log 0.1}{\log 0.875}$$

$$n > 17.24377353$$

$\therefore$ during the 18th year (i.e. 2018) its value will drop to 10% the original cost

Exercise 14C; 5, 6, 7, 9a, 10, 12, 15, 17, 19, 20