

Math 9 – Simple and Compound Interest Review Sheet

Principal: the starting amount you borrow, invest or lend to someone

Interest: the extra money owed at the end

Final Amount: Principal + Interest

Compounding Period: how many times you recalculate interest in a year

Annually – 1 times per year

Semi-Annually – 2 times per year

Quarterly – 4 times per year

Monthly – 12 times per year

Daily – 365 times per year

Every Two Weeks – 26 times per year

Semi-monthly – 24 times per year

Simple Interest

$$I = P \cdot r \cdot t$$

Compound Interest

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

$I =$ Interest

$A =$ Final amount

$P =$ principal

$r =$ Interest rate (decimal)

$t =$ time (in years)

$n =$ number of compounding periods

a) how much interest do I earn

i. Simple Interest

$$\begin{aligned} I &= P \cdot r \cdot t \\ &= \$1000 \cdot 0.08 \cdot 5 \\ &= \underline{\$480} \text{ a)} \end{aligned}$$

$$\begin{aligned} \text{b)} \quad A &= P + I = \$1000 + \$400 \\ &= \underline{\$1400} \end{aligned}$$

b) what is the final amount using:

ii. Compound interest, compounded Annually

$$\begin{aligned} A &= P \left(1 + \frac{r}{n}\right)^{nt} \quad \overline{n=1} \\ A &= \$1000 \left(1 + \frac{0.08}{1}\right)^{(1 \cdot 5)} \\ &= \$1000(1 + 0.08)^5 \\ A &= \underline{\$1469.33} \text{ b)} \end{aligned}$$

$$\begin{aligned} \text{a)} \quad I &= A - P \\ &= \$1469.33 - \$1000 \\ &= \underline{\$469.33} \end{aligned}$$

iii. Compound interest, compounded Semi-Annually

$$\begin{aligned} A &= P \left(1 + \frac{r}{n}\right)^{nt} \quad \overline{n=2} \\ &= \$1000 \left(1 + \frac{0.08}{2}\right)^{(2 \cdot 5)} \\ &= \$1000(1 + 0.04)^{10} \end{aligned}$$

$$A = \underline{\$1480.24} \text{ b)}$$

$$\begin{aligned} \text{a)} \quad I &= A - P = \$1480.24 - \$1000 \\ &= \underline{\$480.24} \end{aligned}$$

iv. Compound interest, compounded Monthly

$$\begin{aligned} A &= \$1000 \left(1 + \frac{0.08}{12}\right)^{12 \cdot 5} \\ &= \$1000 \left(1 + 0.0066666666\right)^{60} \\ &= \underline{\$1489.85} \text{ b)} \end{aligned}$$

$$\begin{aligned} \text{a)} \quad I &= \$1489.85 - \$1000 \\ &= \underline{\$489.85} \end{aligned}$$

Homework:

Answers: