

## Math 9 – Simple and Compound Interest Review Sheet

Principal: Starting amount borrowed, invested or lent to someone

Interest: extra money owed at the end

Final Amount: principal + Interest

Compounding Period: how often we recalculate interest in 1 year

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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 in 1 year

If I invested \$1000 for 5 years at 8%,

a) how much interest do I earn

b) what is the final amount using:

i. Simple Interest

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

$$= \$1000 \cdot 0.08 \cdot 5$$

$$= \underline{\$400} \text{ a)}$$

$$\text{b) } A = P + I = \$1000 + \$400$$

$$= \underline{\$1400}$$

ii. Compound interest, compounded Annually

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

$$= \$1000 \left(1 + \frac{0.08}{1}\right)^{(1 \cdot 5)}$$

$$= \$1000 (1 + 0.08)^5$$

$$A = \underline{\$1469.33} \text{ b)}$$

$$\text{a) } I = A - P = \$1469.33 - \$1000$$

$$= \underline{\$469.33}$$

iii. Compound interest, compounded Semi-Annually

$$A = P \left(1 + \frac{r}{n}\right)^{nt} \quad \overline{n=2}$$

$$= \$1000 \left(1 + \frac{0.08}{2}\right)^{(2 \cdot 5)}$$

$$= \$1000 (1 + 0.04)^{10}$$

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

$$\text{a) } I = A - P = \$1480.24 - \$1000$$

$$= \underline{\$480.24}$$

iv. Compound interest, compounded Monthly

$$A = P \left(1 + \frac{r}{n}\right)^{nt} \quad \overline{n=12}$$

$$\text{a) } = \$1000 \left(1 + \frac{0.08}{12}\right)^{(12 \cdot 5)}$$

$$\text{b) } = \$1000 (1 + 0.006666666\dots)^{60}$$

$$= \underline{\$1489.85} \text{ b)}$$

$$I = \$1489.85 - \$1000$$

$$= \underline{\$489.85}$$