

Backend Developer Assignment

Screenshots of the rendered output:-

Template 1 — Pythagorean Triplet

Given

Right triangle with legs a and b, hypotenuse c. Given a = 3, b = 4

Answer: c = 5

Use Pythagoras: $c^2 = a^2 + b^2$

$$\begin{aligned} c^2 &= 3^2 + 4^2 \\ &= 9 + 16 = 25 \end{aligned}$$

$$c = \sqrt{25} = 5$$

Template 1 — Simple Interest

Given

Principal P = ₹1200, Rate r = 5% per annum, Time t = 3 years

Answer: SI = ₹180

Simple Interest formula: $SI = P \cdot r \cdot t / 100$

$$\begin{aligned} SI &= \frac{1200 \cdot 5 \cdot 3}{100} \\ &= \frac{18000}{100} = 180 \end{aligned}$$

Simple Interest = ₹180; Amount = ₹1200 + ₹180 = ₹1380

Template 2 — Compound Interest (Annual)

Given: P = ₹5000

Amount after 2 years = ₹6050

Find r

Use $A = P(1 + r/100)^n \rightarrow 6050 = 5000(1 + r/100)^2$

$$\begin{aligned} \frac{6050/5000}{(1 + r/100)^2} &\rightarrow 1.21 = (1 + r/100)^2 \end{aligned}$$

Take square root: $1 + r/100 = \sqrt{1.21} = 1.1$

$$r/100 = 0.1 \rightarrow r = 10\%$$

Answer: r = 10%

Template 2 — Compound Interest (Quarterly)

Given: $P = ₹2000$

$r = 8\%$ p.a., $n = 2$ years, comp quarterly

Find Amount

Quarterly rate $= 8/4 = 2\%$ per quarter, number of quarters $= 2 \times 4 = 8$

$$A = P(1 + r_q/100)^8 = 2000(1 + 2/100)^8$$

$$= 2000 * (1.02)^8$$

$$\approx 2000 * 1.171659 = 2343.318$$

Amount $\approx ₹2343.32$

Answer: $A \approx ₹2343.32$