Investing and borrowing - Practice test 2

10 questions | 57 marks | 70 minutes

An original mixed topic paper. Show calculations, label rates and periods, and explain conclusions using the supplied hypothetical financial rules. Round final monetary answers to cents unless a minimum deposit is requested.

Equivalent correct methods earn the corresponding marks.

1. A club fee of AUD 432 includes an 8% increase on last year. [5 marks]

(a) Find last year’s fee. [2 marks]

$\text{Previous fee} = \frac{432}{1.08} = 400.$

Answer: AUD 400.00

(b) If the new fee is discounted 5% for early payment, find the amount paid and the overall change from last year. [3 marks]

$432 \times 0.95 = 410.40.$

$\frac{(410.40 - 400)}{400} \times 100 = 2.6\%.$

Answer: AUD 410.40;2.6% increase

2. Compare two accounts for a AUD 2400 balance held for one year. Both use simple interest. [6 marks]

Hypothetical account rules

Account	Annual rate	Monthly fee
A	4%	AUD 0
B	5%	AUD 2.50

(a) Calculate each final balance. [3 marks]

A $\text{interest} = 2400 \times 0.04 = 96.$

B $\text{interest} = 2400 \times 0.05 = 120; \quad \text{fees} = 12 \times 2.50 = 30.$

Answer: A: AUD 2496; B: AUD 2490.

(b) State which is higher and one condition that could change the comparison. [3 marks]

The extra 1% on 2400 is 24,less than 30 fees.

Answer: A is AUD 6 higher; a different starting balance, fee or eligible rate could change the result.

3. Using a 365-day year, AUD 9125 is invested at 4% simple interest. [6 marks]

(a) Find interest for 73 days. [3 marks]

$I = \frac{9125 \times 0.04 \times 73}{365} = 73.$

Answer: AUD 73.00

(b) A student uses 73 as the time in the annual formula. Explain the error. [3 marks]

Rate and time units must match.

Answer: 73 would mean 73 years;73 days must be $\frac{73}{365}$ year.

4. AUD 6500 earns 5.2% nominal annual interest compounded quarterly for 18 months. [5 marks]

(a) State the periodic rate and number of periods. [2 marks]

$i = \frac{0.052}{4} = 0.013; \quad n = 4 \times 1.5 = 6.$

Answer: 1.3% per quarter;6 quarters

(b) Find the final balance and total interest. [3 marks]

$A = 6500(1.013)^{6}.$

$\text{Interest} = A - 6500.$

Answer: AUD 7,023.77 final; AUD 523.77 interest

5. A club separately needs AUD 2000 in 2 years and AUD 3000 in 4 years. Each fund is a single deposit earning 5% annually. [6 marks]

(a) Find each deposit to the nearest cent. [3 marks]

$\text{PV}_1 = \frac{2000}{1.05^{2}}; \quad \text{PV}_2 = \frac{3000}{1.05^{4}}.$

Answer: AUD 1,814.06 and AUD 2,468.11

(b) Find the combined minimum deposit if each fund is rounded up separately. [3 marks]

Round each required starting sum upward to cents, then add.

Answer: AUD 4,282.17

6. An investment has an effective annual rate of 10%. [6 marks]

(a) Find an equivalent quarterly rate to 3 decimal places. [3 marks]

$i = 1.10^{\frac{1}{4}} - 1.$

Answer: 2.411%

(b) Explain why 2.5% per quarter is not exactly equivalent. [3 marks]

Dividing an effective rate by 4 ignores within-year compounding.

Answer: $1.025^{4} - 1 = 10.381\%$, which exceeds 10%.

7. For two years, A pays 4.5% compounded annually. B pays 6% in Year 1 and 3% in Year 2. No fees, starting balance AUD 5000. [6 marks]

(a) Find each final value. [3 marks]

$A = 5000(1.045)^2$.

$B = 5000 \times 1.06 \times 1.03$.

Answer: AUD 5,460.13 in A; AUD 5,459.00 in B

(b) If B charges a AUD 15 closing fee, which finishes higher and by how much? [3 marks]

Subtract 15 from B's final balance, then compare.

Answer: A by AUD 16.13

8. Purchase 150 shares at AUD 12 with AUD 20 brokerage. Receive AUD 0.40 dividend per share; selling brokerage will be AUD 20. [5 marks]

(a) Find total purchase cost and dividend. [2 marks]

$150 \times 12 + 20 = 1820$.

$150 \times 0.40 = 60$.

Answer: AUD 1820 cost; AUD 60 dividend

(b) Find the selling price per share needed to break even, to the nearest cent. [3 marks]

$150s - 20 + 60 = 1820$.

$s = \frac{1780}{150} = 11.8666\ldots$,so a cent-quoted price of 11.87 is needed.

Answer: AUD 11.87 per share

9. Investment X rises 20% over 2 years. Investment Y rises 28% over 3 years, each with one starting payment and one final receipt. [6 marks]

(a) Find equivalent annual rates to 3 decimal places. [3 marks]

Annualise by taking the appropriate root.

Answer: 9.545% for X; 8.577% for Y

(b) Which has the larger annual rate, and why is the comparison not a complete investment decision? [3 marks]

A growth-rate ranking does not compare omitted features.

Answer: X; risk, access, fees and timing constraints have not been supplied.

10. Two hypothetical loans finance AUD 2400 for one year. Flat loan F charges 6% simple interest and a AUD 36 fee. Loan R requires 12 monthly payments of AUD 210 and no fee. [6 marks]

(a) Find the total paid and extra cost under each. [3 marks]

$F = 2400 + 144 + 36 = 2580.$

$R = 12 \times 210 = 2520.$

Answer: F: AUD 2580 total/AUD 180 extra; R: AUD 2520 total/AUD 120 extra

(b) Explain why comparing 6% with the repayment amount is meaningless. [3 marks]

Compare complete cash flows over the stated same period.

Answer: One is a rate and the other is a payment; the second loan’s interest rule is not specified by 210 alone.