

MAT402 ASSESSMENT 1
ANSWER SCHEME

QUESTION 1

- a) Given that the sequence 71, 65, 59, ... , -13. Calculate
- The number of terms in the sequence
 - The sum of the sequence.

$$a = 71, d = -6, l = -13$$

- i. The number of terms;

$$T_n = a + (n - 1)d$$

$$T_n = -13$$

$$-13 = 71 + (n - 1)(-6)$$

$$-13 = 71 - 6n + 6$$

$$6n = 71 + 6 + 13$$

$$6n = 90$$

$$n = 15$$

The number of terms in the sequence is 15.

- ii. The sum of the sequence;

$$S_n = \frac{n}{2}[2a + (n - 1)d]$$

$$S_{15} = \frac{15}{2}[2(71) + (15 - 1)(-6)]$$

$$= 435$$

- b) The fourth term and seventh term of a geometric sequence are $\frac{27}{16}$ and $\frac{729}{1024}$ respectively. Find the first term and the common ratio.

$$T_4 = \frac{27}{16}, T_7 = \frac{729}{1024}, T_n = ar^n$$

$$ar^4 = \frac{27}{16} \dots \dots \dots (1)$$

$$ar^7 = \frac{729}{1024} \dots \dots \dots (2)$$

Solve simultaneous equation; $eqn (2) \div eqn (1)$

$$r^3 = \frac{27}{64}$$

$$r = \frac{3}{4}$$

Substitute $r = \frac{3}{4}$ into $eqn (1)$

$$a\left(\frac{3}{4}\right)^4 = \frac{27}{16}$$

$$a = \frac{16}{3}$$

- c) A high-rise building provides shop-lots to be rented. Rent is cheaper on the upper floors of shop space. The ground, first, and second floors rent for RM4925, RM4625, and RM4325 per month, respectively. How much is the rent on the eleventh floor?

$$4925, 4625, 4325, \dots$$

$$a = 4925, d = 300$$

$$T_n = a + (n - 1)d$$

$$T_{12} = 4925 + (12 - 1)(300) = 8225$$

QUESTION 2

- a) Sarah deposited RM 10500 four years ago in an account that gave 5.5% simple interest per annum. Find

- i. The accumulated amount today
- ii. The total interest earns today

$$P = RM10500, r = 0.055$$

- i. The accumulated amount;

$$S = P(1 + rt)$$

$$S = 10500(1 + 0.055(4))$$

$$S = RM 12810$$

- ii. Total Interest;

$$I = S - P$$

$$I = 12810 - 10500 = RM2310$$

- b) Mary invested in an investment fund that offered a simple interest rate of 6% per annum. After 5 months, the investment was worth RM8,200. Find the principal amount of the investment.

$$S = RM8200, r = 0.06, t = \frac{5}{12}$$

$$S = P(1 + rt)$$

$$8200 = P \left(1 + 0.06 \left(\frac{5}{12} \right) \right)$$

$$8200 = P \left(\frac{41}{40} \right)$$

$$P = RM 8000$$

- c) Danial borrowed RM 50000 at 6.9% simple interest rate per annum on 15 March 2021. If he was charged RM 1725 simple interest, find the date he settled the loan using approximate time and ordinary simple interest.

$$P = RM50000, r = 0.069, I = RM1725$$

$$I = Prt$$

$$1725 = 50000 \times 0.069 \times t$$

$$t = 0.5 \text{ years}$$

$$t = \frac{\text{no of days}}{360} = 0.5$$

$$\text{no of days} = 180$$

Date:

	No of days
30/3 – 15/3	15 days
April	30 days
May	30 days
June	30 days
July	30 days
August	30 days
15 September	15 days
Total	180 days

Date settle the loan : 15 September 2021