

Penyelesaian Lengkap

Praktis 8

Praktis Formatif

8.1 Pemodelan Matematik Mathematical Modeling

- 1 (a) Dalam masalah ini, kita mengetahui jumlah wang yang diperuntukkan untuk memasang lebih lampu ialah RM3 000. Kita perlu menghitung bilangan lampu yang perlu dipasang untuk menentukan sama ada peruntukan wang tersebut adalah mencukupi.

In this problem, we know that the amount of money allocated to set up more lights is RM3 000. We need to calculate the number of lights required in order to determine whether the money allocated is sufficient.

- (b) Andaian yang perlu dibuat:

Assumptions that need to be made:

- Semua lampu yang dibeli adalah sama jenis dan sama harga.

All the lights bought are of the same kind and same price.

- Semua lampu yang sedia ada berfungsi dengan baik.

All the existing lights are functioning well.

- Semua perbelanjaan sepanjang masa pemasangan lampu termasuk upah pekerja tidak diambil dikira.

The expenses throughout the setting up of lights including the wages of the workers are not taken into account.

- (c) Pemboleh ubah yang terlibat ialah P , bilangan lampu yang diperlukan dan h , harga bagi sebiji lampu.

The variables involved are P , the number of lights required and h , the price of one light.

- 2 (a) Dalam masalah ini, kita mengetahui ketebalan terakhir kertas tersebut. Kita perlu menentukan ketebalan asal kertas tersebut dan bilangan kali kertas tersebut dilipat dua untuk mencapai ketebalan terakhir.

In this problem, we know the final thickness of the paper. We need to determine the initial thickness of the paper and the number of times it is folded into half to achieve the final thickness.

- (b) Andaian yang perlu dibuat:

Assumptions that need to be made:

- Ketebalan kertas itu adalah seragam.

The thickness of the paper is uniform.

- Kertas tersebut tidak berlubang.

The paper does not have holes.

- (c) Pemboleh ubah yang terlibat ialah n , bilangan kali kertas itu dilipat, a , ketebalan asal kertas tersebut dan p , ketebalan terakhir kertas tersebut.

The variables involved are n , the number of times the paper is folded into half, a , the initial thickness of the paper and p , the final thickness of the paper.

- 3 (a) Dalam masalah ini, kita mengetahui ketinggian maksimum bola tersebut daripada lantai semasa pemain itu menjang. Kita perlu menentukan sama ada pemain tersebut dapat memasukkan bola tersebut ke dalam jaring.

In this problem, we know the maximum height of the ball from the floor when he shoot the ball. We need to determine whether the player manage to shoot the ball into the net.

- (b) Andaian yang perlu dibuat:

Assumptions that need to be made:

- Pemain tersebut tidak terjatuh apabila memasukkan bola tersebut ke dalam jaring.

The player did not fall when he shoot the ball.

- Cuaca pada hari itu adalah cerah.

The weather is fine on that day.

- (c) Pemboleh ubah yang terlibat ialah v , ketinggian asal bola tersebut daripada lantai dan m , jarak jaring tersebut dari pemain.

The variables involved are v , the initial height of the ball from the floor and m , the distance of the net from the player.

- 4 (a) (i) $s = b - 3$ (ii) $s = b + 3$

- (b) b dan l and s

- (c) fungsi linear/linear function

- (d) (i) $\frac{20}{b-3}$ (ii) $\frac{20}{b+3}$

- (e) $\frac{20}{b-3} + \frac{20}{b+3} = 4$

$$b + 3 + b - 3 = \frac{4}{20}(b + 3)(b - 3)$$

$$2b = \frac{1}{5}(b^2 - 9)$$

$$10b = b^2 - 9$$

$$b^2 - 10b - 9 = 0$$

$$b = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(-9)}}{2(1)}$$

$$= \frac{10 \pm \sqrt{100 + 36}}{2}$$

$$= \frac{10 \pm 11.6619}{2}$$

$$= \frac{10 + 11.6619}{2} \text{ atau /or}$$

$$= \frac{10 - 11.6619}{2}$$

$$= 10.83 \text{ atau/or } -0.83095 \text{ (ditolak/ rejected)}$$

Kelajuan bot bagi perjalanan ke arah hulu

The speed of boat moving upstream

$$= 10.83 - 3 = 7.83 \text{ km j}^{-1}/\text{km h}^{-1}$$

5 (a) $P = at^{0.5}$

$$\frac{30}{5} = a(9^{0.5})$$

$$a = 2$$

(b) P dan l ialah pemboleh ubah
P and l are variables

(c) $\frac{\text{masa}}{\text{bilangan ayunan}} = 2(l^{0.5})$

$$\frac{\text{time}}{\text{number of oscillations}} = 2(l^{0.5})$$

$$l = \left(\frac{\text{masa}}{2 \times \text{bilangan ayunan}} \right)^2$$

$$l = \left(\frac{\text{time}}{2 \times \text{number of oscillations}} \right)^2$$

| Masa (saat) Time (seconds) | Panjang/Length (m) |
|-------------------------------|-----------------------------------------------|
| 5 | $\left(\frac{5}{2 \times 5}\right)^2 = 0.25$ |
| 10 | $\left(\frac{10}{2 \times 5}\right)^2 = 1$ |
| 15 | $\left(\frac{15}{2 \times 5}\right)^2 = 2.25$ |
| 20 | $\left(\frac{20}{2 \times 5}\right)^2 = 4$ |
| 25 | $\left(\frac{25}{2 \times 5}\right)^2 = 6.25$ |

6 (a) (i) $L(x) = \frac{1}{2}(2x + 6x)(x + 2)$

$$L(x) = (4x)(x + 2)$$

$$L(x) = 4x^2 + 8x$$

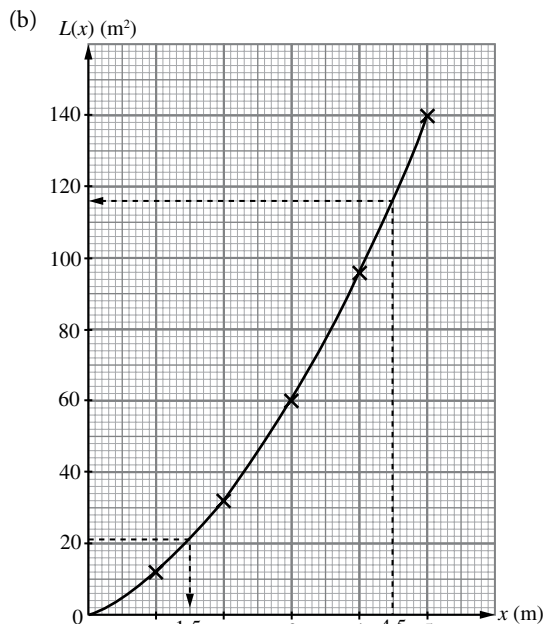
(ii) x dan/and L

(iii) fungsi kuadratik/quadratic function

(iv)

| x | $L(x)$ |
|---------------------------------------------------------------------------|----------------------|
| 1 | $4(1)^2 + 8(1) = 12$ |
| $4x^2 + 8x = 32$ $x^2 + 2x - 8 = 0$ $(x + 4)(x - 2) = 0$ $x = 2$ | 32 |
| 3 | $4(3)^2 + 8(3) = 60$ |

| x | $L(x)$ |
|----------------------------------------------------------------------------|-----------------------|
| $4x^2 + 8x = 96$ $x^2 + 2x - 24 = 0$ $(x + 6)(x - 4) = 0$ $x = 4$ | 96 |
| 5 | $4(5)^2 + 8(5) = 140$ |



- (c) (i) 116 m^2
(ii) 1.5 m

7 (a) g ialah pemalar; t dan F ialah pemboleh ubah.
g is the constant; t and F are the variables.

(b) (i) $F = 5t^2$

(ii) Fungsi kuadratik/Quadratic function

(c) (i) $F = 5(10^2)$

$$F = 500 \text{ m}$$

$$500 \text{ m} + 1 \text{ m} = 501 \text{ m}$$

(ii) $130 - 5 = 5(t^2)$

$$125 = 5t^2$$

$$t^2 = 25$$

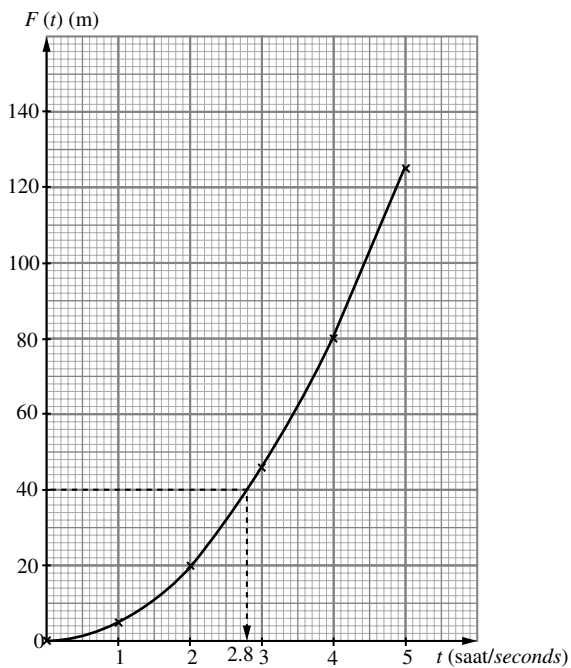
$$t = 5 \text{ s}$$

(iii) $322 - x = 5(8^2)$

$$x = 2 \text{ m}$$

| | | | | | | | |
|---------|-----|---------------------------------|---------------------------------|----------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| (d) (i) | t | 0 | 1 | 2 | 3 | 4 | 5 |
| | F | $F = 5t^2$ $= 5(0)$ $= 0$ | $F = 5t^2$ $= 5(1)$ $= 5$ | $F = 5t^2$ $= 5(4)$ $= 20$ | $F = 5t^2$ $= 5(9)$ $= 45$ | $F = 5t^2$ $= 5(16)$ $= 80$ | $F = 5t^2$ $= 5(25)$ $= 125$ |

(ii)



(iii) $t = 2.8$ saat/seconds

(iv) $F = 0$ meter kerana apabila $t = 0$, batu tersebut masih berada di tebing.

$F = 0$ metre because when $t = 0$, the stone is still on the cliff.

(e) (i) $h = 45 - 5t^2$
 $45 - 5t^2 = 0$
 $5t^2 = 45$
 $t^2 = 9$
 $t = 3$ s

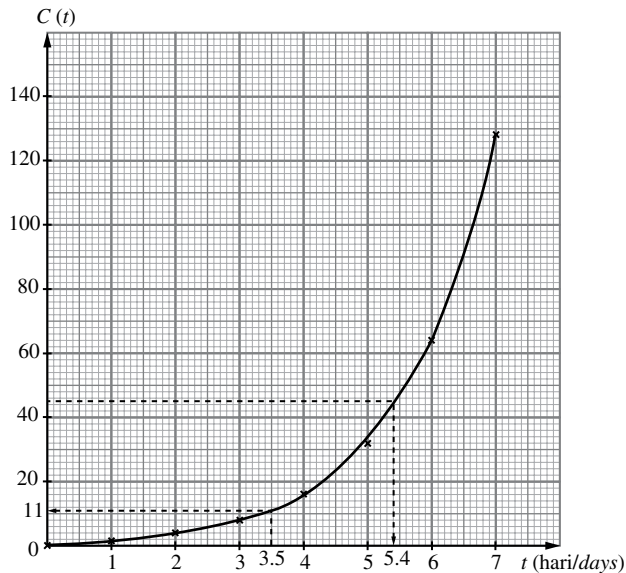
(ii) titik maksimum/maximum point

8 (a) $C(t) = 2^t$

| | | |
|-----|---------------------|-------------|
| (b) | t (minit/minutes) | $C(t)$ |
| | 1 | 2 |
| | 2 | 4 |
| | 3 | 8 |
| | 4 | 16 |
| | 5 | $2^5 = 32$ |
| | 6 | $2^6 = 64$ |
| | 7 | $2^7 = 128$ |

(c) Fungsi eksponen/Exponential function

(d) (i)



(ii) (a) 5.4 hari/days

(b) 11 orang/people

Praktis Sumatif

Kertas 1

- 1 D 2 A 3 B 4 C 5 C
6 C

Kertas 2

Bahagian/Section A

- 1 (a) Nilai simpanan Puan Chong apabila pelaburannya matang
Value of Madam Chong's savings when the investment is matured
 $= \text{RM}20\,000 \times (1 + 0.06)^{10}$
 $= \text{RM}35\,816.95$
- (b) Jumlah faedah yang diperolehi Puan Chong
Total interest obtained by Madam Chong
 $= \text{RM}35\,816.95 - \text{RM}20\,000$
 $= \text{RM}15\,816.95$

Bahagian/Section C

- 2 (a) (i) $V = \frac{15\pi d^2}{4}$
(ii) $V = 15\pi r^2$
(iii) 15π ialah pemalar; V dan r ialah pemboleh ubah.
 15π is the constant; V and r are the variables.

$$(b) \quad (i) \quad V = 15\pi\left(\frac{r}{2}\right)^2$$

$$= \frac{15\pi r^2}{4}$$

$$(ii) \quad V = 15\pi r^2 - \frac{15\pi r^2}{4}$$

$$= \frac{45\pi r^2}{4}$$

$$(iii) \quad \text{RM}2 - \text{RM}2 \times 25\% \\ = \text{RM}1.50$$

(c)

| r | V |
|-----|-------------------------------------------|
| 1.0 | $\frac{45(3.142)1^2}{4}$ $= 35.348$ |
| 1.5 | $\frac{45(3.142)1.5^2}{4}$ $= 79.532$ |
| 2.0 | $\frac{45(3.142)2^2}{4}$ $= 141.39$ |
| 2.5 | $\frac{45(3.142)2.5^2}{4}$ $= 220.922$ |