

SKEMA PEMARKAHAN MATHS KERTAS 2 PEPERIKSAAN PERCUBAAN SPM 2022

1.

$$(i) \begin{pmatrix} 9 \\ 2-m \end{pmatrix} + \begin{pmatrix} 3 \\ 4m \end{pmatrix} = \begin{pmatrix} 12 \\ m \end{pmatrix}$$

$$\begin{pmatrix} 12 \\ 2-m+4m \end{pmatrix} = \begin{pmatrix} 12 \\ m \end{pmatrix}$$

$$2+3m=m$$

$$3m-m=-2$$

$$2m=-2$$

$$m=-1$$

(2 markah)

$$(ii) (3n \ 5n) \begin{pmatrix} 2 \\ -4 \end{pmatrix} = (28)$$

$$(6n-20n) = (28)$$

$$-14n = 28$$

$$14n = -28$$

$$n = -2$$

(2 markah)

2.

$$(a) n(V) = 6$$

$$n(E) = 7$$

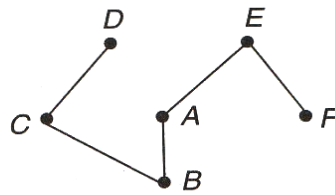
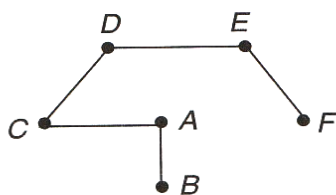
$$\Sigma d(v) = 2 \times n(E)$$

$$= 2 \times 7$$

$$= 14$$

(2 markah)

(b)



(2 markah)

3.

(a) Premium tahunan / Annual premium

$$= \text{RM}450\,000 \times \frac{\text{RM}7.49}{\text{RM}1\,000}$$

$$= \text{RM}3\,370.50$$

(1 MARKAH)

(b) Premium (Insurans) / Premium (Insurance)

$$= \text{RM}120\,000 \times \frac{\text{RM}12.47}{\text{RM}1\,000}$$

$$= \text{RM}1\,496.40$$

Premium (Penyakit kritikal)

Premium (Critical illness)

$$= \text{RM}120\,000 \times \frac{45}{100} \times \frac{\text{RM}3.62}{\text{RM}1\,000}$$

$$= \text{RM}195.48$$

Jumlah premium / Total premium

$$= \text{RM}1\,496.40 + \text{RM}195.48$$

$$= \text{RM}1\,691.88$$

(3 MARKAH)

4.

$$\begin{array}{l|l} \text{(a)} & y \propto \frac{x}{\sqrt{z}} \\ & y = \frac{kx}{\sqrt{z}} \\ & 4 = \frac{k(8)}{\sqrt{36}} \\ & 8k = 24 \\ & k = 3 \end{array} \quad \begin{array}{l} y = \frac{3x}{\sqrt{z}} \\ 5 = \frac{3(20)}{\sqrt{s}} \\ \sqrt{s} = \frac{60}{5} = 12 \\ (\sqrt{s})^2 = (12)^2 \\ s = 144 \end{array}$$

(2 MARKAH)

$$\begin{array}{l} \text{(b)} \quad G \propto p^m q^n \\ G = kp^m q^n \\ G = \frac{kp^2}{q^3} \\ G = kp^2 q^{-3} \\ \therefore m = 2, n = -3 \end{array}$$

(2 MARKAH)

5. a. BJKLG (1 MARKAH)

b. AIE (1 MARKAH)

c. AHG/CDE (1 MARKAH)

d. K (1 MARKAH)

6.i. Jumlah faedah

$$= PRT$$

$$= 20\,000 \times 7\% \times 4$$

$$= \text{RM } 5600 \quad (2 \text{ MARKAH})$$

ii. Ansuran Bulanan

$$= \frac{20000 + 5600}{4 \times 12}$$

$$= \text{RM } 533.33 \quad (2 \text{ MARKAH})$$

7. a. $4 \times 8^1 + 3 \times 8^0 \leq x \leq 1 \times 5^2 + 2 \times 5^1 + 2 \times 5^0$

$$35 \leq x \leq 37$$

Maka $x = 36$ (2 MARKAH)

b. 100100_2 (2 MARKAH)

- 8.
- (a) Jika $x \leq 10$, maka $x \leq 5$ (2 MARKAH)
If $x \leq 10$, then $x \leq 5$
- (b) Palsu / False (2 MARKAH)

9. (a) 15 saat (1 MARKAH)

(b) $\frac{0-20}{30-25}$

$$\frac{-20}{5}$$

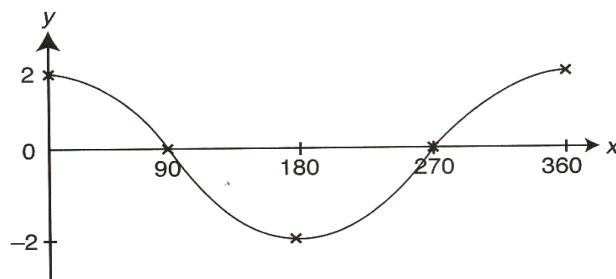
-4 m/s⁻² (1MARKAH)

(c) $\frac{1}{2}(v+20)10 + 15 \times 20 + \frac{1}{2} \times 5 \times 20 = 525$

$$5V + 100 + 300 + 50 = 525$$

V = 15 m/s (2 MARKAH)

10.a.

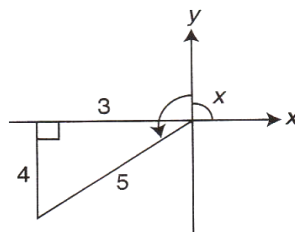


(2 MARKAH)

(b) x terletak di sukuan ketiga

x is in third quadrant

$$\sin x = -\frac{4}{5}$$



(2 MARKAH)

11.

$$\begin{aligned} \text{(a)} \quad x = -2, \quad 2(4) + b(-2) + 6 &= 0 \\ 8 - 2b + 6 &= 0 \\ 2b &= 14 \\ b &= 7 \end{aligned} \quad (2 \text{ MARKAH})$$

$$\begin{aligned} \text{(b)} \quad \frac{5}{p-4} - \frac{5p-6}{p(p-4)} &= \frac{5p}{p(p-4)} - \frac{5p-6}{p(p-4)} \\ &= \frac{5p - (5p-6)}{p(p-4)} \\ &= \frac{5p - 5p + 6}{p(p-4)} = \frac{6}{p(p-4)} \end{aligned} \quad (2 \text{ MARKAH})$$

c)

$$\begin{aligned} 2(5y - 1 + x + 3) &= 144 \\ x + 5y + 2 &= 72 \\ x + 5y &= 70 \dots\dots \textcircled{1} \\ 5y - 1 &= 3(x + 3) \\ 5y - 1 &= 3x + 9 \\ 3x - 5y &= -10 \dots\dots \textcircled{2} \\ \textcircled{1} + \textcircled{2}: \quad 4x &= 60 \\ x &= 15 \end{aligned}$$

Dari / From $\textcircled{1}$:

$$\begin{aligned} 15 + 5y &= 70 \\ 5y &= 70 - 15 \\ 5y &= 55 \\ y &= 11 \end{aligned}$$

(4 MARKAH)

12.

(a)

I	II	III
Markah	Kekerapan	Titik Tengah
31 – 40	2	35.5
41 – 50	4	45.5
51 – 60	9	55.5
61 – 70	12	65.5
71 – 80	8	75.5
81 – 90	3	85.5
91 – 100	2	95.5

(3 MARKAH)

(b) Histogram: Rujuk graf

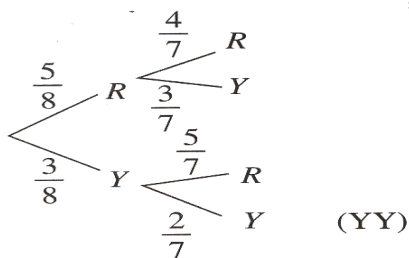
(4 MARKAH)

$$\begin{aligned}
 & \text{(c) (ii) } (2 \times 35.5 + 4 \times 45.5 + 9 \times 55.5 + 12 \times 65.5 + 8 \times 75.5 + \\
 & \quad 3 \times 85.5 + 2 \times 95.5) / 40 \\
 & \quad = 64.75
 \end{aligned}$$

(3 MARKAH)

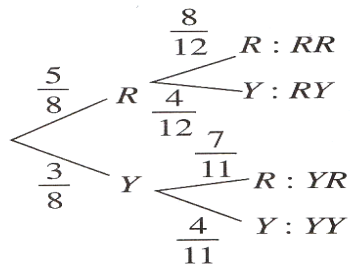
13.

$$\begin{aligned}
 \text{(i) Kebarangkalian / Probability} &= \frac{3}{8} \times \frac{2}{7} \\
 &= \frac{3}{28}
 \end{aligned}$$



(2 MARKAH)

(ii)



$$\begin{aligned}
 \text{(a) Kebarangkalian} &= RR \\
 \text{Probability} &= \frac{5}{8} \times \frac{8}{12} = \frac{5}{12}
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) Kebarangkalian} &= RY + YR \\
 \text{Probability} &= \left(\frac{5}{8} \times \frac{4}{12} \right) + \left(\frac{3}{8} \times \frac{7}{11} \right) \\
 &= \frac{5}{24} + \frac{21}{88} = \frac{59}{132}
 \end{aligned}$$

(6 MARKAH)

14.

(a) Simpanan bulanan / *Monthly savings*
 $= 12\% \times \text{RM}6\,250$
 $= \text{RM}750$

(1 MARKAH)

b)

Pendapatan dan perbelanjaan <i>Income and expenses</i>	RM	
Pendapatan bersih / <i>Net income</i>	6 250	
Gaji bersih / <i>Net salary</i>	6 250	
Tolak simpanan bagi dana kecemasan <i>Minus savings for emergency fund</i>	750	
Baki pendapatan <i>Income balance</i>		5 500
Tolak perbelanjaan tetap bulanan <i>Minus monthly fixed expenses</i>		
Ansuran pinjaman perumahan <i>Housing loan instalment</i>	1 150	
Ansuran pinjaman kereta <i>Car loan instalment</i>	650	
Insurans / <i>Insurance</i>	300	
Jumlah perbelanjaan tetap bulanan <i>Total monthly fixed expenses</i>		2 100
Tolak perbelanjaan tidak tetap bulanan <i>Minus monthly variable expenses</i>		
Runcit + Bil utiliti <i>Groceries + Utility bills</i>	500	
Petrol	300	
Pemberian kepada ibu bapa <i>Allowance for parents</i>	450	
Anak-anak / <i>Children</i>	300	
Makanan / <i>Food</i>	1 250	
Jumlah perbelanjaan tidak tetap bulanan <i>Total monthly variable expenses</i>		2 800
Pendapatan lebihan / <i>Surplus of income</i>		600

(4 MARKAH)

c)

Simpanan dalam 6 bulan / *Savings in 6 months*

$$= \text{RM}600 \times 6$$

$$= \text{RM}3\,600$$

$$\text{RM}3\,600 > \text{RM}3\,200$$

Matlamat jangka pendek akan dicapai

The short term goal will be achieved

Simpanan dalam 5 tahun / *Savings in 5 years*

$$= \text{RM}600 \times 5 \times 12$$

$$= \text{RM}36\,000$$

Simpanan bersih / *Net savings*

$$= \text{RM}36\,000 - \text{RM}3\,200$$

$$= \text{RM}32\,800$$

Wang pendahuluan / *Down payment*

$$= 10\% \times \text{RM}450\,000$$

$$= \text{RM}45\,000$$

$$\text{RM}32\,800 < \text{RM}45\,000$$

Matlamat jangka panjang tidak akan dicapai kecuali dia menggunakan sebahagian simpanannya dalam dana kecemasan.

The long term goal won't be achieved except he uses some of the savings in the emergency fund.

(4 MARKAH)

15. a. W ialah Putaran 90° lawan arah jam pada pusat (3, 4)

(4 MARKAH)

b. V ialah Pembesaran pada pusat (0, 5) dengan faktor skala 2.

(3 MARKAH)

c. luas sisiempat ABCD $= (2)^2 \times 20$

$$= 80$$

(3 MARKAH)

16. a. $x^2 + x - x = 0$

$$(x + 2)(x - 1) = 0$$

$$X = 1 \text{ atau } x = -2$$

(4 MARKAH)

b)

(a) $N = 20, \bar{x} = 53$

$$\bar{x} = \frac{\sum x}{N}$$

$$53 = \frac{\sum x}{20}$$

$$\begin{aligned}\sum x &= 53 \times 20 \\ &= 1\,060\end{aligned}$$

$$\begin{aligned}\text{Varians} &= \frac{\sum x^2}{N} - (\bar{x})^2 \\ \text{Variance} &= \frac{\sum x^2}{N} - 53^2\end{aligned}$$

$$23 = \frac{\sum x^2}{20} - 53^2$$

$$\frac{\sum x^2}{20} = 23 + 2\,809$$

$$\begin{aligned}\sum x^2 &= 20(23 + 2\,809) \\ &= 56\,640\end{aligned}$$

(b) Varians baharu / *New variance* = 23

(6 MARKAH)

c)

- (a) Cukai pendapatan (RM50 000 yang pertama)

Income tax (First RM50 000) = RM1 800

Cukai pendapatan (RM12 740 berikutnya)

Income tax (Next RM12 740)

$$= \text{RM}12\,740 \times \frac{14}{100}$$

$$= \text{RM}1\,783.60$$

Jumlah cukai pendapatan / *Total income tax*

$$= \text{RM}1\,800 + \text{RM}1\,783.60$$

$$= \text{RM}3\,583.60$$

(2 MARKAH)

- (b) Jumlah potongan bulan / *Total monthly deductions*

$$= \text{RM}275 \times 12$$

$$= \text{RM}3\,300.00$$

$$\text{RM}3\,300 < \text{RM}3\,583.60$$

Potongan PCB itu tidak mencukupi untuk membayar cukai pendapatan.

The PCB deduction is not enough to pay for the income tax.

(3 MARKAH)

17. i.

(a) $8x + 9y = 137$ ①

$$7x + 3y = 76$$
 ②

(b) ② $\times 3$: $21x + 9y = 228$ ③

$$8x + 9y = 137$$
①

$$\textcircled{3} - \textcircled{1}: 13x = 91$$

$$x = 7$$

Dari / *From* ②: $7(7) + 3y = 76$

$$3y = 76 - 49$$

$$= 27$$

$$y = 9$$

(6 MARKAH)

c.

i $n(\xi) = 40$

(i) $8 + 9 - x + x + 10 - x + 10 + 6 - x + 7 = 40$

$$50 - 2x = 40$$

$$2x = 10$$

$$x = 5$$

(3 MARKAH)

$$\begin{aligned}
 \text{(ii) } n[(M \cap E)' \cap S] &= 9 - x + 10 + 6 - x \\
 &= 25 - 2x \\
 &= 25 - 2(5) \\
 &= 15
 \end{aligned}$$

$$\begin{aligned}
 \text{(iii) Kebarangkalian / Probability} &= \frac{5}{40} \times \frac{4}{39} \\
 &= \frac{1}{78}
 \end{aligned}$$

(6 MARKAH)

12.C

