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SPM SEMINAR 2019

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PART 2

MATHEMATICS

VIDEO PEMBELAJARAN LENGKAP DI

Tingkatan 4



Tingkatan 5



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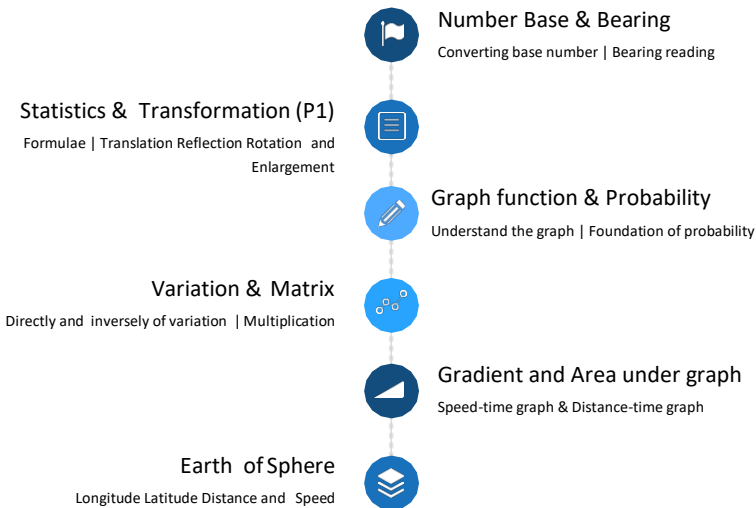


SPMflix

Mathematics

Presented by: Mathew Pang

Our Agenda for Today



Number Base & Bearing

Converting base number | Bearing reading

Number Base

5. State the value of digit 2, in base 10 in the number 3200_5
Nyatakan nilai digit 2, dalam asas 10 bagi nombor 3200_5
- A 24
B 50
C 104
D 256
6. $101010_2 - 1011_2 =$
- A 11110_2
B 11111_2
C 10110_2
D 11001_2

Sarawak 2018 – Paper 1 – Q5&Q6

Number Base

- 5 What is the place value of the digit 2 in the number 7235_8 ?
Apakah nilai tempat bagi digit 2 dalam nombor 7235_8 ?

A 2
B 64
C 128
D 512

MRSM 2018 – Paper 1 – Q5

- 6 Given $x - 43_5 = 402_5$, find the value of x in base ten.
Diberi $x - 43_5 = 402_5$, cari nilai x dalam asas sepuluh.

A 1000
B 625
C 445
D 125

MRSM 2018 – Paper 1 – Q6

Number Base

- 3 Express 13_5 as a number in base ten.

A 5
B 8
C 23
D 32

JUJ 2018 – Paper 1 – Q3

- 4 Given that $x > 22$ such as x is an integer. Express the minimum value of x in base eight.

A 22_8
B 23_8
C 26_8
D 27_8

JUJ 2018 – Paper 1 – Q4

Number Base

- 5 Diagram 1 shows a number card in base five.

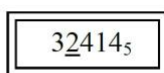


Diagram 1

State the value of the underlined digit, in base ten.

- A 1 250
B 250
C 50
D 10

- 6 Given $M_2 + 1011_2 = 11001_2$.
Find the value of M .

- A 10 0100
B 10 000
C 1 100
D 1 110

Perlis 2018 – Paper 1 – Q5

Perlis 2018 – Paper 1 – Q6

Bearing

- 15 Diagram 9 shows the locations of Market, Clinic and Post Office in a certain town. Clinic is due south of Market. The bearing of Post Office from Market and Post Office from Clinic are 138° and 104° respectively.

Rajah 9 menunjukkan lokasi Pasar, Klinik dan Pejabat Pos di sebuah bandar. Klinik berada di selatan Pasar. Bearing Pejabat Pos dari Pasar dan Pejabat Pos dari Klinik masing-masing ialah 138° dan 104° .

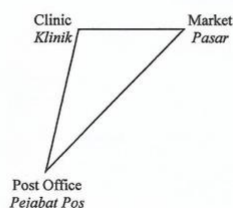


Diagram 9
Rajah 9

Find the bearing of Clinic from Post Office.

Cari bearing Klinik dari Pejabat Pos.

- A 034°
B 138°
C 284°
D 318°

MRSM 2018 – Paper 1 – Q15

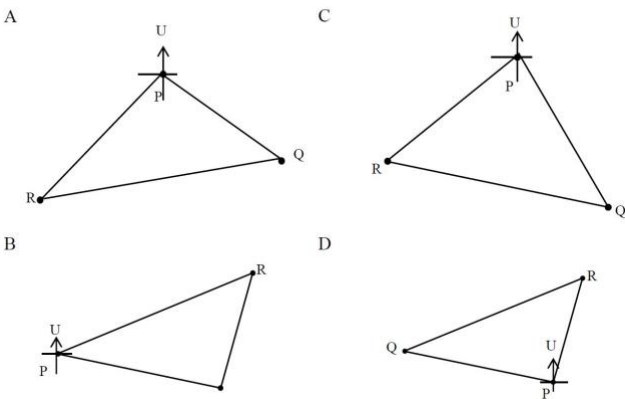
Bearing

- 16 A yacht leaves Q to P which is at a bearing of 100° from Q . Then, it continues its journey to R which is at bearing of 230° from P . Given that $\angle QRP = 30^\circ$, find the bearing of R from Q .
- A 100°
B 160°
C 180°
D 200°

MRSM 2018 – Paper 1 – Q16

Bearing

- 13 Bearing Q from P is 120° and bearing P from R is 020° . Bearing Q from R is 050° . Which of the following represent the location of P , Q and R ?



JUJ 2018 – Paper 1 – Q13

Bearing

17 Diagram 11 shows three points, A , B and C on a horizontal plane. C lies due north of B and the bearing C from A is 70° .

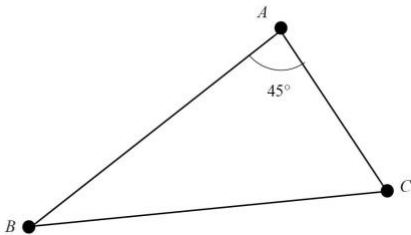


Diagram 11
Rajah 11

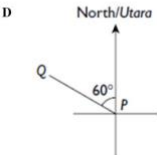
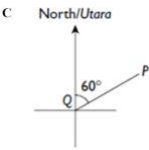
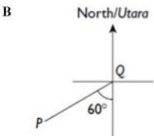
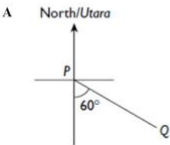
Find the bearing of A from B .

- A 065°
- B 245°
- C 295°
- D 335°

Perlis 2018 – Paper 1 – Q17

Bearing

17 Points P and Q lie on a horizontal plane. The bearing of P from Q is 120° . Which of the following diagrams shows the positions of P and Q ?



Sarawak 2018 – Paper 1 – Q17

Statistics & Transformation (P1)

Formulae | Translation Reflection Rotation and Enlargement

Statistics (Paper 1)

25 The ogive in Diagram 11 represents the temperature (T) of 60 different samples.

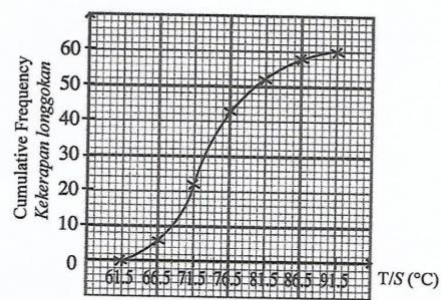


Diagram 11

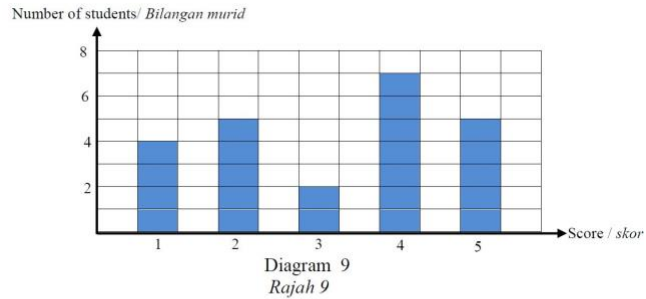
The modal class is

- A 86.5 – 91.5
- B 87 – 91
- C 71.5 – 76.5
- D 72 – 76

MRSM 2018 – Paper 1 – Q25

Statistics (Paper 1)

- 19 Diagram 9 is a bar chart showing a score obtained by a group of students in a quiz.



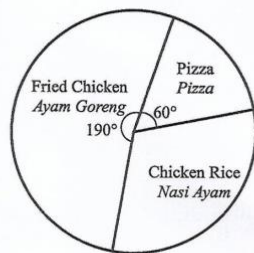
Which of the following is true?

- A Score mode is 5.
- B Mean is 3.17.
- C Total number of students is 24.
- D Median is 3.

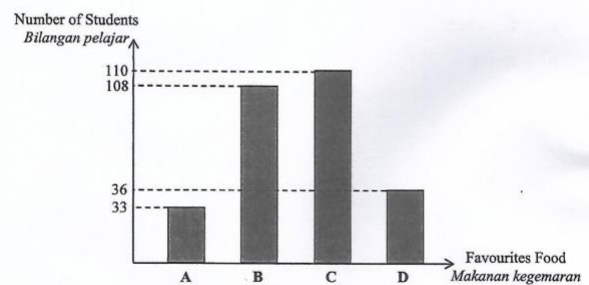
JUJ 2018 – Paper 1 – Q19

Statistics (Paper 1)

- 26 Diagram 12 is a pie chart showing the favourites food chosen by a number of students.



Given 57 students chose the Fried Chicken as their favourite. Which of the following bars, A, B, C or D represents those who chose the Chicken Rice as their favourite food?



MRSM 2018 – Paper 1 – Q26

Statistics (Paper 1)

- 27 Table 1 shows the number of children for 30 families in Taman Z.

Number of Children <i>Bilangan anak</i>	0	1	2	3	4	5	6
Frequency <i>Frekuensi</i>	3	2	4	3	5	7	6

Table 1
Jadual 1

Find the median of the data.

- A 3
- B 4
- C 5
- D 7

MRSM 2018 – Paper 1 – Q27

Statistics (Paper 1)

- 28 Table 2 below shows the heights of a group of students.

Height (cm) <i>Tinggi (cm)</i>	Number of students <i>Bilangan pelajar</i>
145	4
150	x
155	8
160	2
165	3
170	1

Table 2
Jadual 2

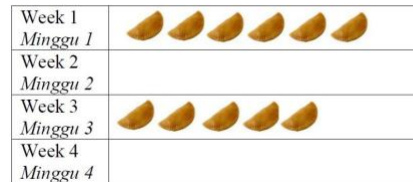
If the mean height of the students is 154.2 cm, find the value of x .

- A 5
- B 6
- C 7
- D 9

Sarawak 2018 – Paper 1 – Q28

Statistics (Paper 1)

- 32 Diagram 13 is an incomplete pictograph showing the number of packet of frozen curripuff sold by Puan Ani in four weeks.




 Represent 10 packets of curripuff
Mewakili 10 bungkusan karipap

Diagram 13

The ratio of curripuff sold in first week to the curripuff sold in fourth week is 2:3. One packet of curripuff sold at RM6 and the total sale in four weeks is RM1 680. Calculate the percentage of sales in the second week.

- A 4.76%
- B 28.57%
- C 46.43%
- D 60.71%

JUJ 2018 – Paper 1 – Q32

Statistics (Paper 1)

- 33 Diagram 14 is a line graph showing pocket money received by a group of students.

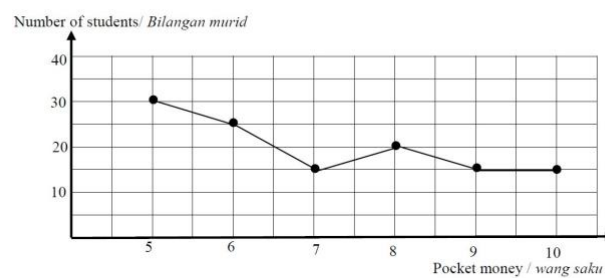


Diagram 14

If the information is represented by pie chart, calculate the angle of sector for mode of pocket money.

- A 15°
- B 30°
- C 45°
- D 90°

JUJ 2018 – Paper 1 – Q33

Transformation (Paper1)

10 Diagram 5 shows points P, Q, R and S on the Cartesian Plane.

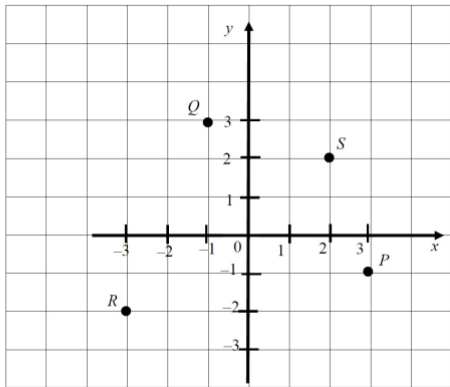


Diagram 5
Rajah 5

Find the correct pairing of the object, line of reflection and its image.

	Object <i>Objek</i>	Axis of reflection <i>Paksi pantulan</i>	Coordinate of image <i>Koordinat Imej</i>
A	P	y-axis <i>paksi-y</i>	P' (1, 3)
B	Q	y-axis <i>paksi-y</i>	Q' (3, 1)
C	R	x-axis <i>paksi-x</i>	R' (-3, 2)
D	S	x-axis <i>paksi-x</i>	S' (2, -3)

Perlis 2018 – Paper 1 – Q10

Transformation (Paper1)

11 In Diagram 6, ABC is the image of DEC under an enlargement. Given that CD = 8 cm, CE = 4 cm and the scale factor of enlargement is 3.

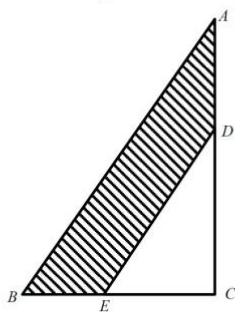


Diagram 6
Rajah 6

Calculate the area, in cm², of shaded region.

- A 48
- B 96
- C 128
- D 144

Perlis 2018 – Paper 1 – Q11

Transformation (Paper1)

7 Diagram 3 shows a regular hexagon PQRSTU.

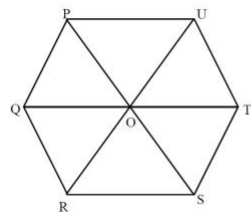


Diagram 3
Rajah 3

Given that R is the image of point P under rotation at point O. Which of the following is true?

	Angle of rotation <i>Sudut putaran</i>	Direction of rotation <i>Arah putaran</i>
A	90 °	Clockwise <i>Arah ikut jam</i>
B	120 °	Anticlockwise <i>Arah lawan jam</i>
C	240 °	Anticlockwise <i>Arah lawan jam</i>
D	270 °	Clockwise <i>Arah ikut jam</i>

JUJ 2018 – Paper 1 – Q7

Transformation (Paper1)

8 Diagram 4 shows a pentagon drawn on a Cartesian plane.
Rajah 4 menunjukkan sebuah pentagon dilukis pada satah Cartes.

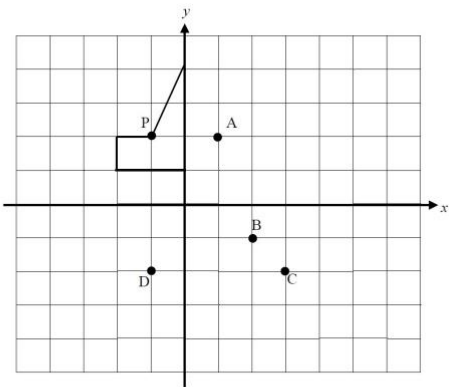


Diagram 4
Rajah 4

Which of the point A,B,C or D is the image of point P under reflection in the line $y = x$?

JUJ 2018 – Paper 1 – Q8

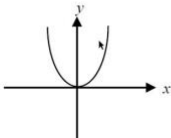
Graph function & Probability

Understand the graph | Foundation of probability

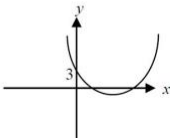
Graph Function

21 Which of the following is the graph for $y = \frac{x^2}{3}$?

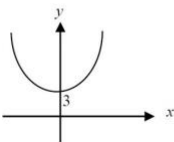
A



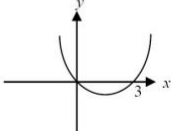
C



B



D



JUJ 2018 – Paper 1 – Q21

Graph Function

29 Diagram 14 shows the sketch of the graph $y = 2x^3 + 16$.

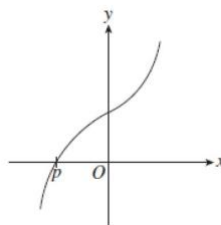


Diagram 14

Find the value of p .

- A 16
- B 8
- C -2
- D -8

Sarawak 2018 – Paper 1 – Q29

Graph Function

- 12** (a) Complete Table 3 in the answer space on page **24**, for the equation $y = -3x^2 + 6x + 13$ by writing down the values of y when $x = -2$ and $x = 2$.
[2 marks]
- (b) For this part of the question, use the graph paper provided on page **25**. You may use a flexible curve rule.
Using a scale of 2 cm to 1 unit on the x -axis and 2 cm to 5 unit on the y -axis, draw the graph of $y = -3x^2 + 6x + 13$ for $-2 \leq x \leq 4$.
[4 marks]
- (c) From the graph in **12(b)**, find
- (i) the value of y when $x = 3.5$,
 - (ii) the negative value of x when $y = -6$.
- (d) Draw a suitable straight line on the graph in **12(b)** to find the value of x which satisfy the equation $3x^2 = 2x + 7$ for $-2 \leq x \leq 4$.
State these values of x .
[4 marks]

Perlis 2018 – Paper 2 – Q12

Graph Function

- 12 (a) Complete Table 2 in the answer space for the equation $y = -\frac{12}{x}$ by writing down the values of y when $x = -2$ and $x = 1.5$.
[2 marks/ markah]
- (b) For this part of the question, use the graph paper provided on page 18. You may use a flexible curve ruler.
Using a scale of 2 cm to 1 unit on the x -axis and 2 cm to 2 units on the y -axis, draw the graph of $y = -\frac{12}{x}$ for $-4 \leq x \leq 4$.
[4 marks/ markah]
- (c) From the graph in 12(b), find
(i) the value of y when $x = 3.5$,
(ii) the value of x when $y = 10$.
- (d) Draw a suitable straight line on the graph in 12(b) to find all the values of x which satisfy the equation $-3x + 1 = -\frac{12}{x}$ for $-4 \leq x \leq 4$. State these values of x .
[4 marks/ markah]

Sarawak 2018 – Paper 2 – Q12

Probability

- 23 Diagram 10 shows a group of students consists of five boys and four girls.



Diagram 10

A student is chosen at random. Which of the following is true?

- A If a student is chosen from the group, the probability of choosing a girl with spectacles is $\frac{1}{2}$.
- B If a student is chosen from the group of boy, the probability of choosing student with spectacles is $\frac{2}{3}$.
- C If a student is chosen from the group of student with spectacles, the probability of choosing a boy is $\frac{2}{3}$.
- D If a student is chosen from the group, the probability of choosing a boy is $\frac{4}{9}$.

JUJ 2018 – Paper 2 – Q23

Probability

- 37 There are 20 boys in Mathematics club. The probability of choosing a girl at random from the club is $\frac{3}{5}$. After holiday, 3 girls move in and become the member of the club. Calculate the number of girl members in Mathematics club now.
- A 11
B 15
C 30
D 33

JUJ 2018 – Paper 2 – Q37

- 35 In a class, there are 16 boys and some girls. A pupil is chosen at random from the class. The probability of choosing a boy is $\frac{2}{3}$. Find the number of girls in the class.
- A 24
B 14
C 12
D 8

Perlis 2018 – Paper 2 – Q35

Probability

- 36 A box contains 40 marbles. There are 17 blue marbles, some green and red marbles. The probability of choosing a green marble is $\frac{3}{8}$.
- If a marble is selected randomly from the box, find the probability that the marble is **not** a red marble.
- A $\frac{1}{5}$
B $\frac{4}{5}$
C $\frac{5}{8}$
D $\frac{7}{8}$

Perlis 2018 – Paper 2 – Q36

Probability

- 10 Diagram 6 shows four students in group A and another four students in group B.

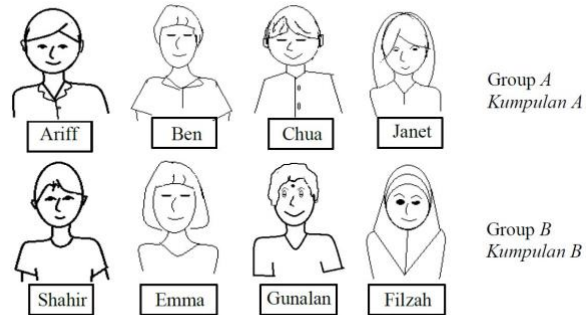


Diagram 6

A student is chosen at random from each group to form a team to participate in a quiz.

- (a) List the sample space to show the combination of all the possible teams.
- (b) By listing down all the possible outcomes of the event, find the probability that
 - (i) a team consist of a male student and a female student,
 - (ii) a team has at least a female student.

[6 marks]

Perlis 2018 – Paper 2 – Q10

Probability

- 4 Table 4 shows the record of number of room bookings of Elin Hotel in Jeju Island, Korea for the year 2016, categorised by season and room type.

	Peak season <i>Musim puncak</i>	Off-peak season <i>Bukan musim puncak</i>
Single <i>Bujang</i>	125	248
Couple <i>Pasangan</i>	220	192
Family <i>Keluarga</i>	98	152

Table 4
Jadual 4

- (a) If a record is selected at random, find the probability that the record was in the peak season.
- (b) If two records of off-peak season are selected at random, find the probability that both records are not of single rooms. Give your answer correct to two decimal places.
- (c) If two records of family room was chosen, find the probability that both records was from the same season. Give your answer correct to two decimal places.

[6 marks]

MRSM 2018 – Paper 2 – Q4

Probability

11. Diagram 11 shows six numbered balls in Bag 1 and four balls which are blue, green, purple and red respectively in bag 2. One ball is chosen at random from Bag 1 and Bag 2



- (a) By using the letter **B** to represent the blue ball, the letter **G** to represent the green ball, the letter **P** to represent the purple ball and the letter **R** to represent the red ball, complete the sample space in the answer space.
- (b) By listing down all the possible outcomes of the event, find the probability that
- (i) a number less than 6 and a green ball are chosen
 - (ii) a number which is multiple of 3 or a red ball is chosen

Answer/ *Jawapan* :

[6 markah]

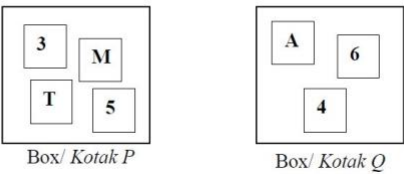
(a)

	1	3	4	5	6	7
(B)	(1,B)	(3,B)			(6,B)	(7,B)
(G)	(1,G)		(4,G)		(6,G)	(7,G)
(P)	(1,P)		(4,P)	(5,P)	(6,P)	
(R)			(4,R)	(5,R)		(7,R)

JUJ 2018 – Paper 2 – 11

Probability

11. Diagram 8 shows two sets of labelled cards put inside Box *P* and Box *Q*.



Diagram/ *Rajah 8*

A card is picked at random from each box.

- (a) List all the sample space.
- (b) By listing all the possible outcomes, find the probability that:
- (i) both cards picked are alphabets.
 - (ii) at least one card picked is an odd number.

[6 marks/ markah]

Sarawak 2018 – Paper 2 – 11

Variation & Matrix

Directly and inversely of variation |
Multiplication

Variation

- 36 Given V varies directly as t , and inversely as the square of r . If $V = kt^p r^q$ where k is a constant, find the value of p and of q .

- A $p=1, q=2$
- B $p=-1, q=2$
- C $p=1, q=-2$
- D $p=-1, q=-2$

MRSM 2018 – Paper 1 – 36

- 37 Given that p varies directly as square root of q and $p = 18$ when $q = 36$. Calculate the value of p when $q = 169$.

- A $\frac{13}{3}$
- B $\frac{3}{13}$
- C 39
- D 26

Perlis 2018 – Paper 1 – 37

Variation

37 Table 2 shows the changes in x , y and z .

x	d	$\frac{1}{2}$
y	e	m
z	2	7

Table 2
Jadual 2

Given x varies inversely as y and z . Find the value of m when $de = 7$.

- A 1
- B 4
- C 14
- D 49

MRSM 2018 – Paper 1 – 37

Variation

37 Given X varies directly as the square root of Y . State the relationship between X and Y .

- A $X \propto \frac{1}{Y^2}$
- B $X \propto Y^2$
- C $X \propto Y^{\frac{1}{2}}$
- D $X \propto \frac{1}{Y^{\frac{1}{2}}}$

Sarawak 2018 – Paper 1 – 37

38 x varies directly as square of y . Given that $x = 3$ when $y = 4$. Find the constant, k for the equation that relate x and y .

- A 6
- B 2
- C $\frac{3}{4}$
- D $\frac{3}{16}$

JUJ 2018 – Paper 1 – 38

Variation

- 38 Diagram 18 shows a few patterns drawn in square grids. The length of sides of each patterns is h and the number of dots in each pattern is d .

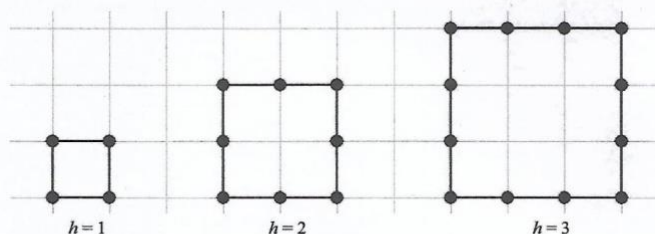


Diagram 18
Rajah 18

Based on the diagram, which of the following statements is true?

- A h varies directly of d and $h = 20$ when $d = 5$.
- B h varies inversely of d and $h = 20$ when $d = 5$.
- C h varies directly of d and $h = 5$ when $d = 20$.
- D h is varies inversely of d and $h = 5$ when $d = 20$.

MRSM 2018 – Paper 1 – 38

Variation

- 39 Diagram 17 shows a graph P versus $\frac{1}{T^2}$.

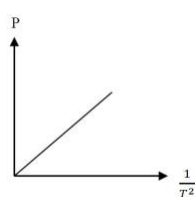


Diagram 17
Rajah 17

Express P in term of T when $P = 2$ and $T = 9$.

- A $P = \frac{162}{T^2}$
- B $P = \frac{2}{81} T^2$
- C $P = \frac{6}{T^2}$
- D $P = \frac{2}{3} T^2$

JUJ 2018 – Paper 1 – 39

Matrix

Sarawak 2018 – Paper 1 – 40

40 Given the matrix equation $(k \ 3) \begin{pmatrix} -5 & 0 \\ k & 4 \end{pmatrix} = (6 \ 12)$, find the value of k .

- A -4
B -3
C 3
D 4

40 $(3 \ 2) \begin{pmatrix} 1 & 2 \\ -2 & -1 \end{pmatrix} =$

- A $\begin{pmatrix} -1 \\ 4 \end{pmatrix}$
B $(-1 \ 4)$
C $\begin{pmatrix} 7 \\ 8 \end{pmatrix}$
D $(7 \ 8)$

Perlis 2018 – Paper 1 – 40

MRSM 2018 – Paper 1 – 40

40 Given that $\begin{bmatrix} 3 & 4(r+2) \end{bmatrix} \begin{pmatrix} 1 & -4 \\ 2 & 5 \end{pmatrix} = (11 \ 8)$, find the value of r .

- A $-\frac{5}{2}$
B $-\frac{11}{8}$
C -1
D 0

20 Given matrix $Q = \begin{pmatrix} -3 & 0 & 12 \\ 7 & 14 & 5 \end{pmatrix}$. State element of q_{12} .

- A 0
B 7
C 12
D No element / tiada unsur

JUJ 2018 – Paper 1 – 20

Matrix

40 Given $\begin{pmatrix} 2 & -2 \\ -1 & 6 \end{pmatrix} \begin{pmatrix} x \\ x-y \end{pmatrix} = \begin{pmatrix} 4 \\ -1 \end{pmatrix} - \begin{pmatrix} y \\ -1 \end{pmatrix}$, find the value of x and the value of y .

	x	y
A	$\frac{12}{5}$	2
B	$\frac{8}{5}$	$\frac{4}{3}$
C	$\frac{4}{15}$	$\frac{4}{3}$
D	$\frac{2}{5}$	2

JUJ 2018 – Paper 1 – 40

Matrix

$$39 \begin{pmatrix} 3 \\ 2 \\ -5 \end{pmatrix} - 4 \begin{pmatrix} 1 \\ -3 \\ 7 \end{pmatrix} + \begin{pmatrix} 8 \\ -6 \\ 9 \end{pmatrix} =$$

A $\begin{pmatrix} 9 \\ -16 \\ 32 \end{pmatrix}$

B $\begin{pmatrix} 7 \\ 8 \\ -24 \end{pmatrix}$

C $\begin{pmatrix} 10 \\ -16 \\ 32 \end{pmatrix}$

D $\begin{pmatrix} 10 \\ 8 \\ -24 \end{pmatrix}$

Sarawak 2018 – Paper 1 – 39

39 Given $\begin{pmatrix} -2 & 0 \\ 1 & -1 \end{pmatrix} + 3R = 2 \begin{pmatrix} 7 & -3 \\ 2 & -5 \end{pmatrix}$, find matrix R .

A $\begin{pmatrix} -3 & 2 \\ -5 & 3 \end{pmatrix}$

B $\begin{pmatrix} 3 & -1 \\ -5 & 3 \end{pmatrix}$

C $\begin{pmatrix} 3 & 2 \\ 5 & -3 \end{pmatrix}$

D $\begin{pmatrix} 3 & -2 \\ 5 & -3 \end{pmatrix}$

Perlis 2018 – Paper 1 – 39

Matrix

39 Which of the following statement is **true**?

A For the matrix $\begin{pmatrix} -1 & 2 & 3 \\ 4 & 0 & 7 \end{pmatrix}$, the element in the first row and second column is 4.

B $\begin{pmatrix} 1 \\ -2 \\ 4 \end{pmatrix}$ is called a row matrix.

C The order of the matrix $\begin{pmatrix} -3 & 2 \end{pmatrix}$ is 2×1 .

D Matrix $\begin{pmatrix} 2 & 4 \\ 3 & 6 \end{pmatrix}$ has no inverse matrix.

MRS M 2018 – Paper 1 – 39

Matrix

10. a) Given that matrix $\frac{1}{m} \begin{pmatrix} -3 & -1 \\ -4 & 2 \end{pmatrix} \begin{pmatrix} n & 1 \\ 4 & -3 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$.

Find the value of m and of n which satisfy the above equation.

- b) A stall sells two types of drinks, sugarcane juice and coconut water in two different glasses, regular and large. On one hot day, the amount of drinks sold is shown in the Table 1 below.

Type of drinks <i>Jenis minuman</i>	Regular Glass <i>Gelas Biasa</i>	Large Glass <i>Gelas Besar</i>	Total Sales(RM) <i>Jumlah Jualan(RM)</i>
Sugarcane juice <i>Air tebu</i>	30	20	140
Coconut water <i>Air kelapa</i>	50	40	260

Table/ Jadual 1

By using the matrix method, calculate the price for one regular and one large drink sold.

[6 marks/ markah]

Sarawak 2018 – Paper 2 – 10

Matrix

10 (a). It is given that $K \begin{pmatrix} 1 & \frac{3}{2} \\ 6 & -1 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, where K is a 2×2 matrix. Find K .

- (b) Write the following simultaneous equation as matrix equation.

$$x + \frac{3}{2}y = -4$$

$$6x - y = 16$$

Hence, by using matrix method, calculate the value of x and of y .

[6 marks]

MRSM 2018 – Paper 2 – 10

Matrix

- 8 Fathia works in a furniture factory. She is paid RM x per hour for normal working hours and RM y per hour for overtime work. Table 2 shows the working hours of Fathia in her first two weeks in the factory.

	Normal working hours <i>Waktu bekerja biasa</i>	Overtime working hours <i>Waktu bekerja lebih masa</i>
First week <i>Minggu pertama</i>	36 hours 36 jam	5 hours 5 jam
Second week <i>Minggu kedua</i>	45 hours 45 jam	8 hours 8 jam

Table 2
Jadual 2

Fathia earned RM297 and RM387 in the first week and second week respectively.

- (a) Write two linear equations in terms of x and y to represent the above information.
- (b) Hence, using matrix method, calculate the values of x and y .

[6 marks]

Perlis 2018 – Paper 2 – 8

Gradient and Area under graph

Speed-time graph & Distance-time graph

Gradient and Area under the graph

7. Diagram 5 shows the speed-time graph of the movement of two particles, P and Q , for a period of 14 seconds. The graph $ACDE$ represents the movement of particle P and the graph of AB represents the movement of particle Q . Both particles start from the same point and they move along the same route.

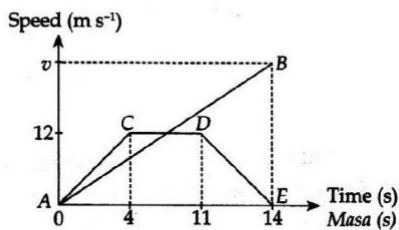


Diagram / Rajah 5

- State the length of time, in seconds, that particle P moves with uniform speed.
- Calculate the rate of change of speed, in ms^{-2} , of particle P in the first 4 seconds
- Given the distances travelled by particle P and Q in 14 seconds are the same, calculate the value of v .

[6 marks / markah]

Sarawak 2018 – Paper 2 – 7

Gradient and Area under the graph

11. Diagram 7 shows the speed-time graph of the movement of a motorcyclist for a period of 30 second.

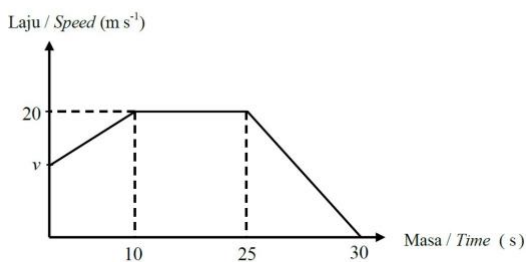


Diagram 7
Rajah 7

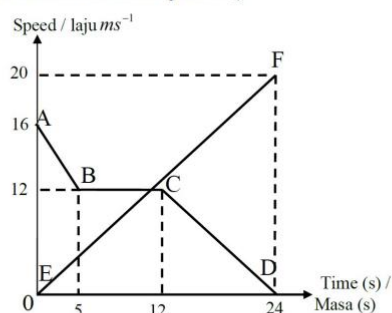
- State the length of time, in second, when the motorcycle move with uniform speed.
- Calculate the rate of change of speed, in ms^{-2} of the motorcycle in the last 5 seconds.
- Given that the total distance travelled by the motorcyclist is 525 m. Find the value of v .

[5 marks]

Perlis 2018 – Paper 2 – 11

Gradient and Area under the graph

9. Diagram 9 shows the speed-time graph for the movements of two particles, P and Q, for the period of 24 second. The graph ABCD represents the movement of particle P. The graph EF represents the movement of particle Q.



Rajah 9 / Diagram 9

- a) (i) State the uniform speed, in ms^{-1} , of particle P.
- (ii) Calculate the rate of change of speed, in ms^{-2} , of particle P for the first 5 seconds.
- b) It is given that the distance traveled by particle Q is 240 m. Find the difference between the distance traveled by the two particles in m.

JUL 2018 – Paper 2 – 9

Earth of Sphere

Longitude Latitude Distance and Speed

Earth as a sphere

- 14 Location of point L is (50°N, 130°E). Point M lies due south of point L such as the difference of latitude of both points is 20°. Point K lies due west of point L such that the difference of longitude between both points is 40°. Which of the following are true?

	Latitude of M <i>Latitud M</i>	Longitude of K <i>Longitud K</i>
A	30°N/ 30°U	90°E / 90° T
B	30°N/ 30°U	90°W / 90° B
C	30°S/ 30°S	90°E / 90° T
D	30°S/ 30°S	90°W / 90° B

JUJ 2018 – Paper 1 – 14

Earth as a sphere

- 18 Diagram 12 shows the positions of five towns, A, B, C, D and X, on the surface of the earth.

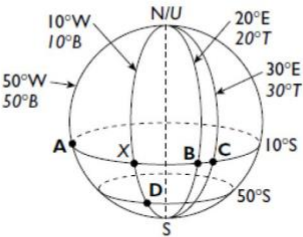


Diagram 12
Rajah 12

Which of the towns, A, B, C or D, is located east of X with a difference in longitude of 40°?

Sarawak 2018 – Paper 1 – 18

Earth as a sphere

- 18 In Diagram 12, N is the North Pole and S is the South Pole, P , Q and R are three points on the earth and lie on the same meridian.

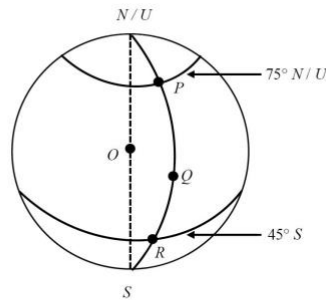


Diagram 12
Rajah 12

Given $PQ = 2 QR$, find the latitude of Q .

- A $35^\circ N/U$
- B $35^\circ S$
- C $5^\circ N/U$
- D $5^\circ S$

Perlis 2018 – Paper 1 – 18

Earth as a sphere

- 17 In Diagram 10, NOS is the axis of the earth. CD is a diameter of the parallel of latitude.
Dalam Rajah 10, UOS ialah paksi bumi. CD ialah diameter selarian latitud.

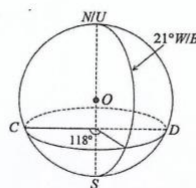


Diagram 10
Rajah 10

Find the longitude of D .
Cari longitud D .

- A $41^\circ E$
 $41^\circ T$
- B $62^\circ E$
 $62^\circ T$
- C $83^\circ E$
 $83^\circ T$
- D $139^\circ E$
 $139^\circ T$

MRSM 2018 – Paper 1 – 17

Earth as a sphere

- 16 $P, Q(40^\circ S, 30^\circ E)$ and R are three points on the surface of the Earth. P is due north of Q and its distance is 6000 nautical miles. QR is the diameter of the parallel of latitude $40^\circ S$. O is the centre of the earth.

$P, Q(40^\circ S, 30^\circ E)$ dan R ialah tiga titik di atas permukaan Bumi. P berada arah utara Q dan jaraknya ialah 6000 batu nautika. PR ialah diameter selarian latitude $40^\circ S$. O ialah pusat bumi.

- (a) Find the location of R . [2 marks]
Cari kedudukan R . [2 markah]
- (b) Find the latitude of P . [3 marks]
Cari latitud P . [3 markah]
- (c) Calculate the distance, in nautical miles, from Q to R measured along the common parallel of latitude. [3 marks]
- (d) An aeroplane took off from P and flew due south to R . The average speed of the journey was 800 knots. Calculate the total time, in hours, taken for the whole flight. If the aeroplane arrived R at 2010 hours, state the departure time of the aeroplane [4 marks]

MRSM 2018 – Paper 2 – 16

Earth as a sphere

- 16 Diagram 11 shows the locations of three cities L, M and P , on the surface of the earth. O is the centre of the earth. The longitude of city L is $120^\circ E$.

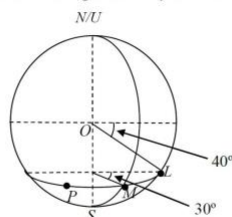


Diagram 11
Rajah 11

If Marsya wants to reach city P as early as possible, which airline company should she choose? Show your working.

[6 marks]

Perlis 2018 – Paper 2 – 16

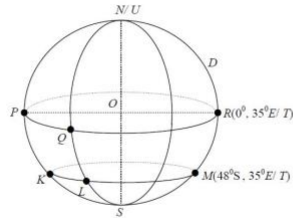
- (a) Find the location of city M . [3 marks]
- (b) City P lies 3447.2 nautical miles due west of city M measured along the common parallel of latitude. Calculate the longitude of city P . [3 marks]
- (c) Marsya is currently at city L . She wants to take a flight to city P to attend a meeting. Table 5 shows the comparison of two airline companies that are offering flight from city L to city P on the same day. Both aeroplanes travel along the common parallel of latitude.

Airline Company Syarikat penerbangan	Departure time Waktu berlepas	Speed of aeroplane (knots) Laju kapal terbang (knot)
Destination Airlines	5.45 a.m.	650
Space Airlines	7.00 a.m.	800

Table 5

Earth as a sphere

- 16 Diagram 12 shows the locations of points K, L, M, P, Q and R on the surface of the earth. O is the centre of the earth.



Diagram/ *Rajah* 12

- (a) Find the location of P .
[2 marks/ markah]
- (b) Given the distance of PQ is 2 160 nautical miles, find the longitude of Q .
[3 marks/ markah]
- (c) Calculate the shortest distance, in nautical miles, from K to the South Pole measured along the surface of the earth.
[3 marks/ markah]
- (d) An aeroplane took off from K and flew east to L , along the common parallel of latitude. Then, it flew due north to Q . The average speed of the aeroplane was 450 knots. Calculate the total time, in hours, taken for the whole flight.
[4 marks/ markah]

Sarawak 2018 – Paper 2 – 16

Earth as a sphere

16. $F(55^\circ\text{N}, 145^\circ\text{W})$, $G(55^\circ\text{N}, 70^\circ\text{W})$, H and J are four points on the surface of the earth. FH is the diameter of the common parallel of latitude 55°N and J is located due south of G .

- (a) State the location of H .
- (b) Calculate the distance, in nautical miles, from G due west to H , measured along the common parallel of latitude
[3 markah]
- (c) Calculate the shortest distance, in nautical miles, from F to H , measured along the surface of the earth.
[2 markah]
- (d) An aeroplane took off from G and flew due south to J with an average speed of 750 knots. The time taken for the flight is 2 hours 30 minutes.
Find / *Cari*
 - (i) the distance, in nautical miles, from G to J , measured along the meridian
 - (ii) the latitude of J .
[4 markah]

JUJ 2018 – Paper 2 – 16

Sila lengkapkan borang penilaian bagi Seminar SPM yang telah anda hadiri. Penilaian anda dapat membantu kami memahami tahap keberkesanan program ini dan seterusnya membolehkan kami meningkatkan kualiti perkhidmatan kami di masa hadapan.

Terima kasih!

Please fill up this form for the session that you are attending. Your evaluation will help us improve our service and help us understand the effectiveness of this program.

Thank you!

1. Nombor Telefon

Phone Number

2. Apakah subjek bagi seminar yang sedang anda sertai sekarang?

What is the seminar's subject that you're attending now?

- | | |
|---------------------------------------|--|
| <input type="radio"/> Bahasa Malaysia | <input type="radio"/> Kimia |
| <input type="radio"/> English | <input type="radio"/> Chemistry |
| <input type="radio"/> Sejarah | <input type="radio"/> Fizik |
| <input type="radio"/> Sains | <input type="radio"/> Physics |
| <input type="radio"/> Science | <input type="radio"/> Matematik Tambahan |
| <input type="radio"/> Matematik | <input type="radio"/> Additional Maths |
| <input type="radio"/> Mathematics | <input type="radio"/> Perniagaan |
| <input type="radio"/> Biologi | <input type="radio"/> Prinsip Perakaunan |
| <input type="radio"/> Biology | <input type="radio"/> Ekonomi |

3. Pernahkah anda menonton mana-mana video BACfreeschool (sebelum ini dikenali sebagai EduNation)?

Have you ever watched any BACFreeschool's (previously known as EduNation) videos?

- ☐ Ya
Yes
- ☐ Tidak
No

4. Nilai kefahaman guru terhadap isi kandungan yang diajar bagi subjek ini.

Rate the teacher's understanding of this particular subject.

Sangat Rendah <i>Very Low</i>	Rendah <i>Low</i>	Sederhana <i>Intermediate</i>	Tinggi <i>High</i>	Sangat Tinggi <i>Very High</i>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Nilai cara penyampaian guru bagi subjek ini.

Rate the teacher's delivery of the subject.

Sangat Tidak Menarik <i>Very Uninteresting</i>	Tidak Menarik <i>Not Interesting</i>	Sederhana <i>Intermediate</i>	Menarik <i>Interesting</i>	Sangat Menarik <i>Very Interesting</i>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Nilai tahap kepuasan terhadap nota tambahan yang telah diberikan.

Rate your satisfaction level with the notes given.

Sangat Tidak Berpuashati <i>Very Unsatisfied</i>	Tidak Berpuashati <i>Not Satisfied</i>	Sederhana <i>Intermediate</i>	Berpuashati <i>Satisfied</i>	Sangat Berpuashati <i>Very Satisfied</i>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Nilai tahap kebergunaan isi kandungan seminar.

Rate the usefulness of the seminar's content to your SPM preparation.

Sangat Tidak Berguna <i>Not Very Useful</i>	Tidak Berguna <i>Not Useful</i>	Sederhana <i>Intermediate</i>	Useful <i>Berguna</i>	Sangat Useful <i>Very Useful</i>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Bagi pendapat anda, 3 jam untuk satu sesi seminar adalah...

In your opinion, 3 hours per session is...

- ☐ terlalu pendek.
too short.
- ☐ bersesuaian.
just right.
- ☐ terlalu panjang.
too long.

9. Adakah anda mempunyai sebarang maklum balas/komen bagi meningkatkan prestasi kami?

Do you have any additional comments, questions, or concerns you would like to share?