

FREE FOR EVERYONE

SPM SEMINAR 2019

#spmseminar 2019 #SPM2019 #BACFlix

PART 1

MATHEMATICS

VIDEO PEMBELAJARAN LENGKAP DI

Tingkatan 4



Tingkatan 5



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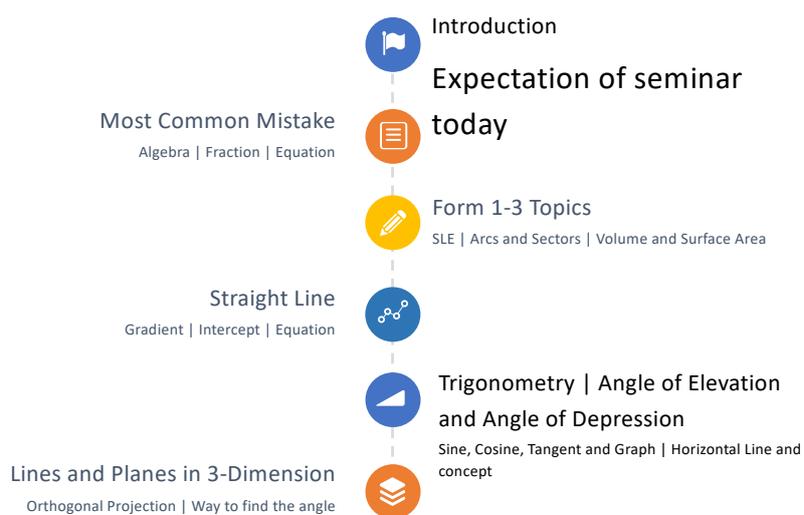


SPMflix

Mathematics

Presented by: Mathew Pang

Our Agenda for Today



2

Introduction

Expectation of seminar today



No Magic

- I will use 3 hours to help you understand and do well in these eight Mathematics topics.
 - What should you do during these 3 hours:
 1. **Listen first** then only write down the important tips
 2. **Practices** these topics again until you fully understand it
 3. **Challenge your friends** about the topics you have learned



“ There are no secrets to success. It is the result of preparation, hard work, and learning from failure. ”

Colin Powell

Most Common Mistake Algebra | Fraction | Equation.

Algebra | Fraction | Equation

• Example 1

$$\frac{x + 2}{3} = 10$$

$$\frac{x}{3} = 10 - 2$$

Algebra | Fraction | Equation

• Example 2

$$\frac{x + 2}{2 + 3y} = 10$$

$$\frac{x}{3y} = 10$$

Algebra | Fraction | Equation

9

• Example 3

$$x + \frac{5}{2} = 10$$

$$x + 5 = 10 \times 2$$

Algebra | Fraction | Equation

10

• Example 4

$$\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$$

$$a + b = c$$

Algebra | Fraction | Equation

11

• Example 5

$$2(x + 3)^2$$

$$(2x + 6)^2$$

Algebra | Fraction | Equation

12

• Example 6

$$\frac{x^3}{y^3} = \left(\frac{x}{y}\right)^3$$

$$\frac{x^3}{y^3} = \left(\frac{y}{x}\right)^{-3}$$

Algebra | Fraction | Equation

13

• Example 7

$$\begin{aligned} & (8x^9y^{15})^{\frac{1}{3}} \\ &= (8x^3y^5) \end{aligned}$$

Algebra | Fraction | Equation

14

• Example 8

**Prime number
start at 2**

Form 1-3 Topics

Simultaneous Linear Equation | Arcs and Sectors | Volume and Surface Area

Simultaneous Equation

Elimination Method

Substitution method

$$\begin{aligned}x + \frac{3}{2}y &= -4 \\6x - y &= 16\end{aligned}$$

$$\begin{aligned}(x + \frac{3}{2}y = -4) \times 6 \\6x - y &= 16\end{aligned}$$

$$\begin{aligned}6x + 9y &= -24 \\6x - y &= 16\end{aligned}$$

$$\begin{aligned}10y &= -40 \\y &= -4\end{aligned}$$

$$\begin{aligned}x + \frac{3}{2}(-4) &= -4 \\x &= 2\end{aligned}$$

$$\begin{aligned}x + \frac{3}{2}y &= -4 \\6x - y &= 16\end{aligned}$$

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

$$6(-4 - \frac{3}{2}y) - y = 16$$

$$-24 - 9y - y = 16$$

$$-10y = 40$$

$$y = -4$$

$$6x - (-4) = 16$$

$$6x = 12$$

$$x = 2$$

Simultaneous Equation

Elimination method | Substitution Method

MRSM 2018 – Paper 2 – Q2

- 2 Solution by matrix method is **not** allowed to answer this question.
Penyelesaian dengan kaedah matriks tidak dibenarkan untuk menjawab soalan ini.

En Azman was assigned to prepare a proposal for the replacement of the broken tiles in a teacher's washroom. En Azman presented two suggestions of design and cost, in RM, for the replacement of the broken tiles as shown in Diagram 2.1 and Diagram 2.2.

En Azman diberi tugasan untuk menyediakan kertas kerja bagi penggantian jubin yang rosak di sebuah tandas guru. En Azman telah membentangkan dua cadangan susunan jubin beserta kos, dalam RM, untuk penggantian jubin tersebut seperti dalam Rajah 2.1 dan Rajah 2.2.



Cost / kos : RM 342

Diagram 2.1
Rajah 2.1



Cost / kos : RM 354

Diagram 2.2
Rajah 2.2

Given that b is the cost, in RM, of a black tile and w is the cost, in RM, of a white tile, write down two equations based on the Diagram 2.1 and 2.2.

Hence, calculate the cost, in RM, of a black tile and of a white tile.

Diberikan b ialah kos, dalam RM, sekeping jubin hitam dan w ialah kos, dalam RM, sekeping jubin putih, tuliskan dua persamaan yang mewakili Rajah 2.1 dan 2.2. Seterusnya, hitung kos, dalam RM, bagi sekeping jubin hitam dan bagi sekeping jubin putih.

[4 marks]
[4 markah]

17

Simultaneous Equation

Elimination method | Substitution Method

Perlis 2018 – Paper 2 – Q3

- 3 Table 1 shows the ticket price for a charity show at SMK Dato' Aznan Jaya.
Jadual 1 menunjukkan harga tiket bagi tayangan amal di SMK Dato' Aznan Jaya.

Category Kategori	Price (RM) Harga (RM)
Adult Dewasa	16.00
Children Kanak-kanak	10.00

Table 1
Jadual 1

The total amount of 125 tickets sold for the charity show is RM1820.

Find the number of the tickets sold to adults and the number of tickets sold to children.

Jumlah nilai jualan bagi 125 tiket dijual di tayangan amal tersebut ialah RM1820.

Cari bilangan tiket yang telah dijual kepada orang dewasa dan bilangan tiket yang telah dijual kepada kanak-kanak.

[5 marks]
[5 markah]

18

Simultaneous Equation

Elimination method | Substitution Method

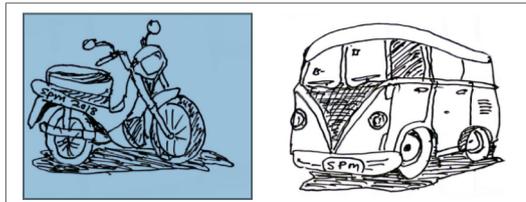
Kedah 2018 – Paper 2 – Q3

3 Penyelesaian dengan kaedah matriks **tidak** dibenarkan untuk menjawab soalan ini.

*Solution by matrix method is **not** allowed to answer this question.*

Rajah 3 menunjukkan sebuah motosikal dan sebuah van 6 tempat duduk.

Diagram 3 shows a motorcycle and a 6-seater van.



Rajah / Diagram 3

Konvoi sekumpulan 72 pelajar, bermotor dan menaiki van (6 tempat duduk) telah sampai di Pantai Merdeka. Hanya 2 orang dibenarkan menaiki motosikal dan 6 orang menaiki van termasuk pemandu. Mereka menaiki kesemua kenderaan sehingga penuh.

A convoy of 72 students, motorized and van (6 seats) arrived at Pantai Merdeka. Only 2 peoples are allowed on motorcycles and 6 are on board in the van including the driver. They ride all the vehicles until they are full.

Hitung bilangan van dan bilangan motosikal jika terdapat 56 tayar.

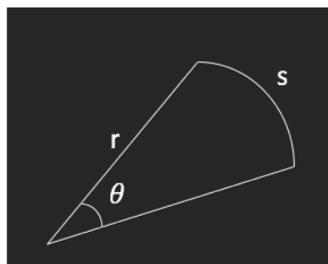
Calculate the number of vans and the number of motorcycles if there are 56 tyres.

19

[5 markah / marks]

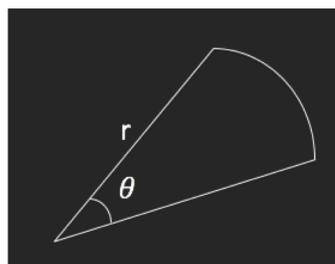
Arcs and Sectors

Arc Length | Perimeter | Area of Sector



$$\text{Arc, } s = \frac{\theta}{360} \times 2\pi r$$

$$\text{Perimeter} = 2r + s$$



$$\text{Area} = \frac{\theta}{360} \times \pi r^2$$

20

Arcs and Sectors

Arc Length | Perimeter | Area of Sector

Negeri Terengganu 2018 – Paper 2 – Q9

- 9 Diagram 9 shows an equilateral triangle OJM with a side of 14 cm. KL and KN are the arcs of two circles centred at O and J respectively. Given N is the midpoint of JM . OJK is a straight line.

Rajah 9 menunjukkan sebuah segi tiga sama sisi OJM dengan sisi 7 cm. KL dan KN ialah lengkok bulatan bagi dua bulatan yang masing-masing berpusat di O dan J . Diberi N ialah titik tengah JM . OJK ialah garis lurus.

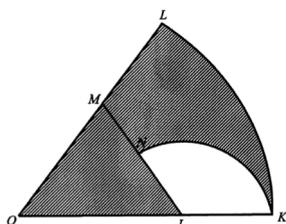


Diagram 9 / Rajah 9

Using $\pi = \frac{22}{7}$, calculate

Menggunakan $\pi = \frac{22}{7}$, hitung

- (a) the area, in cm^2 of the shaded region.
luas, dalam cm^2 kawasan berlorek.
- (b) the perimeter in cm, of the shaded region.
perimeter dalam cm, kawasan berlorek.

[6 marks/markah]

21

Arcs and Sectors

Arc Length | Perimeter | Area of Sector

MRSM 2018 – Paper 2 - Q9

- 9 Diagram 9 shows four lens-shaped region formed by the intersection of four identical circles. $PQRS$ is a square with a side of length 28 cm.

Rajah 9 menunjukkan empat rantau berbentuk lensa yang dihasilkan dengan menyalangkan empat bulatan yang serupa. $PQRS$ ialah sebuah segi empat sama dengan panjang sisi 28 cm.

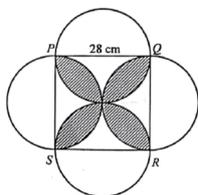


Diagram 9
Rajah 9

Using $\pi = \frac{22}{7}$, calculate,

Menggunakan $\pi = \frac{22}{7}$, hitung,

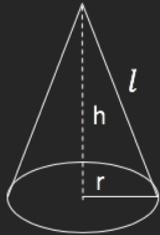
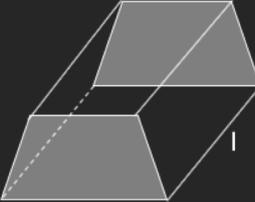
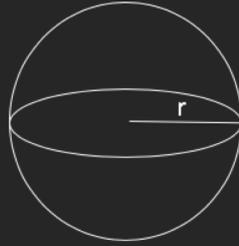
- (a) the perimeter of the shaded region,
perimeter rantau berlorek,
- (b) the area of the shaded region.
luas rantau berlorek.

[6 marks]
[6 markah]

22

Volume and Surface Area

Cylinder | Cone | Prism | Sphere

Cylinder	Cone	Prism	Sphere
			
$v = \pi r^2 h$	$v = \frac{1}{3} \pi r^2 h$	$v = \text{Area} \times l$	$v = \frac{4}{3} \pi r^3$
$A = 2\pi r^2 + 2\pi r h$	$A = \pi r^2 + \pi r l$	$A = \text{find yourself}$	$A = 4\pi r^2$

23

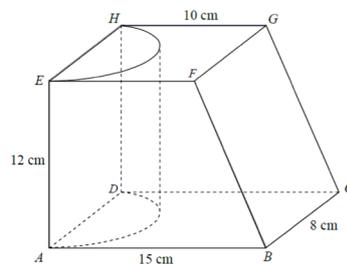
Volume and Surface Area

Cylinder | Cone | Prism | Sphere

Kedah 2018 – Paper 2 – Q5

- 5 Rajah 5 di bawah menunjukkan sebuah prisma tegak dengan tapak segi empat tepat $ABCD$ terletak di atas meja mengufuk. Trapezium $ABFE$ ialah keratan rentas seragam prisma itu. Sebuah separuh silinder dikeluarkan daripada prisma itu.

Diagram 5 shows a solid right prism with rectangular base $ABCD$ on a horizontal table. The trapezium $ABFE$ is the uniform cross section of the prism. A half-cylinder is removed from the prism.



Rajah / Diagram 5

Menggunakan $\pi = \frac{22}{7}$, hitung isi padu, dalam cm^3 , pepejal yang tinggal.

Using $\pi = \frac{22}{7}$, calculate the volume, in cm^3 , of remaining solid.

[4 markah / marks]

24

Volume and Surface Area

Cylinder | Cone | Prism | Sphere

Perlis 2018 – Paper 2 – Q5

Diagram 3 shows a replica built by students of Form Four Wawasan in conjunction with Malaysia Day on 16th of September. The main material used for building the replica is a plasticine.

Rajah 3 menunjukkan sebuah replika yang dibina oleh murid-murid Tingkatan Empat Wawasan bersempena sambutan Hari Malaysia pada 16 September nanti. Bahan yang digunakan untuk membina replika itu ialah plastisin.

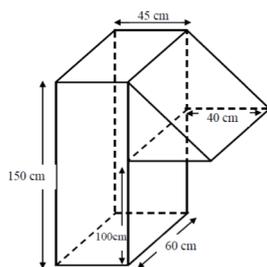


Diagram 3
Rajah 3

A box of plasticine contains the volume of 90cm^3 . How many boxes of plasticines are required for building the replica.

Sekotak plastisin mempunyai isipadu 90cm^3 . Hitung bilangan kotak plastisin yang diperlukan untuk membina replika itu.

[4 marks]
[4 markah]

25

Straight Line

Gradient | Intercept | Equation

Straight Line

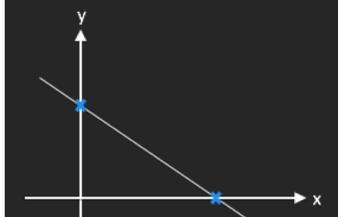
Gradient | Intercept | Equation

Gradient

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = -\frac{y - \text{intercept}}{x - \text{intercept}}$$

Intercept



Equation (Gradient Form)

$$y = mx + c$$

Equation (Intercept Form)

$$\frac{x}{a} + \frac{y}{b} = 1$$

Two MUST have information to form a linear equation:

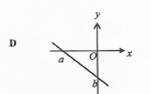
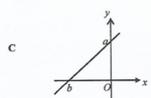
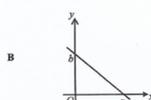
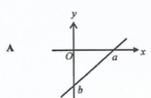
1. Gradient, m
2. Coordinate, (x, y)

Straight Line

Gradient | Intercept | Equation

MRSM 2018 – Paper 1 – Q28

- 28 Which graph represents $\frac{x}{a} - \frac{y}{b} = 1$?
 Graf manakah yang mewakili $\frac{x}{a} - \frac{y}{b} = 1$?



Terengganu 2018 – Paper 1 – Q33

- 33 Diagram 20 shows two straight lines, PQ and RT . It is given that $RT = 13$ cm and R is the midpoint of OP .

Rajah 20 menunjukkan dua garis lurus, PQ dan RT . Diberi bahawa $RT = 13$ cm dan R ialah titik tengah OP .

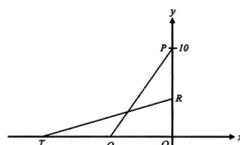


Diagram 20 / Rajah 20

Find the gradient of RT .
 Cari kecerunan RT .

- A $\frac{12}{4}$
 B $\frac{5}{12}$
 C $\frac{12}{5}$
 D $\frac{5}{12}$

Terengganu 2018 – Paper 1 – Q34

- 34 A straight line passes through points $(1, 8)$ and $(4, 2)$. Find the y-intercept of the straight line. Suatu garis lurus melalui titik $(1, 8)$ dan $(4, 2)$. Cari pintasan-y bagi garis lurus itu.

- A 4
 B 5
 C 8
 D 10

Straight Line

Gradient | Intercept | Equation

Perlis 2018 – Paper 2 – Q6

- 6 Diagram 4 shows two parallel straight lines, KL and MN , drawn on Cartesian plane. The straight line RS is parallel to the y -axis. The equation of straight line KL is $\frac{1}{3}(x+y) = 1$ and the length of LN is 5 units.
- Rajah 4 menunjukkan dua garis lurus selari, KL dan MN , dilukis pada suatu satah Cartes. Garis lurus RS adalah selari dengan paksi- y . Persamaan garis lurus KL ialah $\frac{1}{3}(x+y) = 1$ dan panjang LN ialah 5 unit.

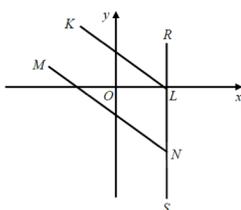


Diagram 4
Rajah 4

- (a) Find the equation of straight line RS .
Cari persamaan garis lurus RS .
- (b) Find the equation of straight line MN .
Cari persamaan garis lurus MN .

[5 marks]
[5 markah]

Straight Line

Gradient | Intercept | Equation

MRSM 2018 – Paper 2 – Q7

- 7 Diagram 7 shows a straight line PQ and point R on a Cartesian plane.
- Rajah 7 menunjukkan garis lurus PQ dan titik R pada satah Cartes.

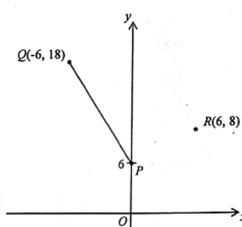


Diagram 7
Rajah 7

- (a) Find the equation of the straight line that parallel to PQ and passes through point R .
Cari persamaan garis lurus yang selari dengan PQ dan melalui titik R .
- (b) Given that S is the midpoint of the straight line PR , find the coordinate of S .
Diberi bahawa S ialah titik tengah garis lurus PR , cari koordinat titik S .

[5 marks]
[5 markah]

Straight Line

Gradient | Intercept | Equation

Terengganu 2018 – Paper 2 – Q7

- 7 Diagram 7 shown straight line PQ , PR and RS drawn on a Cartesian plane. Straight line PR is parallel to y -axis and PQ is parallel to RS . The equation of the straight line RS is $y = 2x + 4$.

Rajah 7 menunjukkan garis lurus PQ , PR dan RS dilukis pada suatu satah Cartes. Garis lurus PR adalah selari dengan paksi- y dan PQ adalah selari dengan RS . Persamaan garis lurus RS ialah $y = 2x + 4$.

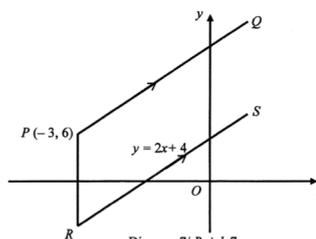


Diagram 7/ Rajah 7

- (a) Find the equation of the straight line PQ .
Cari persamaan bagi garis lurus PQ .
- (b) Find the x -intercept of the straight line PQ .
Cari pintasan- x bagi garis lurus PQ .

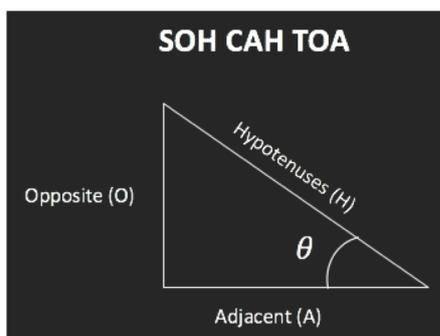
[5 marks/markah]

Trigonometry | Angle Elevation and Angle Depression

Sine Cosine Tangent and Graph | Horizontal
and Concept

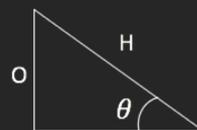
Trigonometry

- Sine | Cosine | Tangent



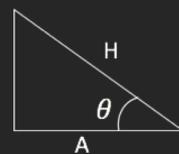
SOH

$$\sin \theta = \frac{O}{H}$$



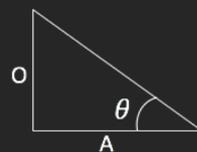
CAH

$$\cos \theta = \frac{A}{H}$$



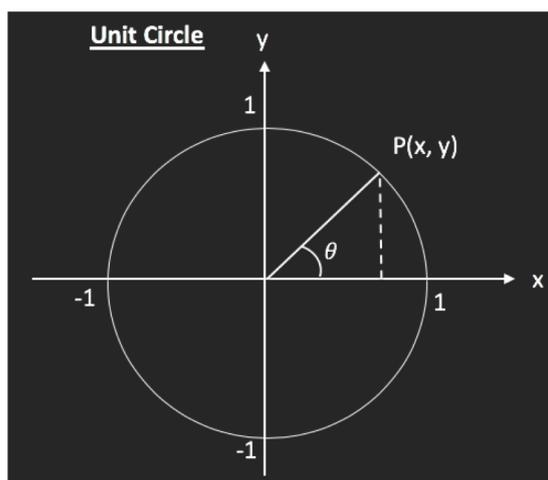
TOA

$$\tan \theta = \frac{O}{A}$$



Trigonometry

- Sine | Cosine | Tangent



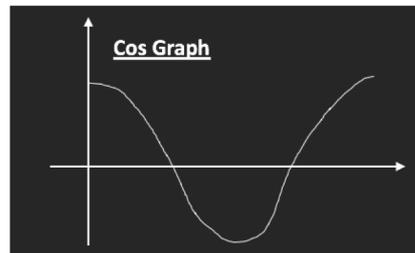
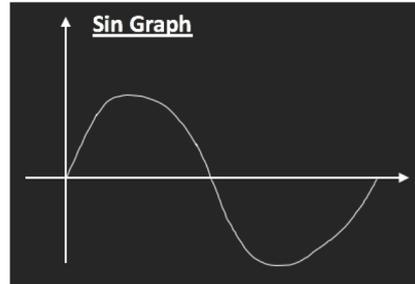
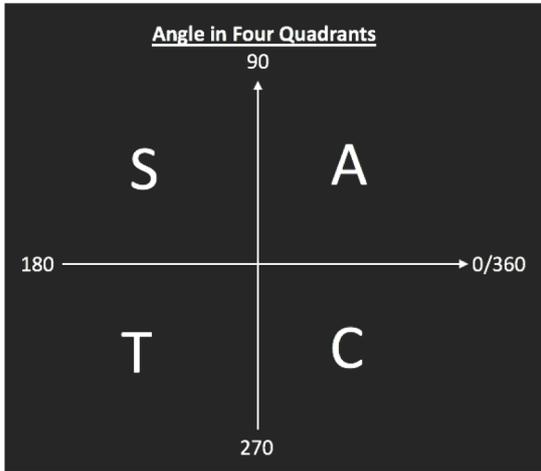
$$\sin \theta = y - \text{coordinate}$$

$$\cos \theta = x - \text{coordinate}$$

$$\tan \theta = \frac{x - \text{coordinate}}{y - \text{coordinate}}$$

Trigonometry

- Sine | Cosine | Tangent



Trigonometry

- Sine | Cosine | Tangent

Terengganu 2018 – Paper 1 – Q12,13,14

- 12 In Diagram 6, O is the centre of a unit circle
 Dalam Rajah 6, O ialah pusat bulatan unit.

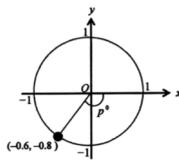


Diagram 6 / Rajah 6

The value of p is
 Nilai p ialah

- A 36.9
- B 53.1
- C 126.9
- D 143.1

- 13 In Diagram 7, PQR is a straight line and $\tan x^\circ = \frac{24}{7}$.
 Dalam Rajah 7, PQR ialah garis lurus dan $\tan x^\circ = \frac{24}{7}$.

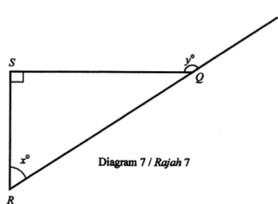


Diagram 7 / Rajah 7

Find the value of $\cos y^\circ$.
 Carikan nilai $\cos y^\circ$.

- A $\frac{24}{25}$
- B $-\frac{24}{25}$
- C $\frac{7}{25}$
- D $-\frac{7}{25}$

- 14 Diagram 8 shows the graphs of Sine and Cosine
 Rajah 8 menunjukkan graf Sinus dan Kosinus

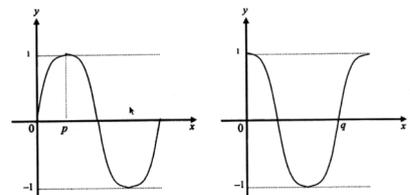


Diagram 8 / Rajah 8

The value of $p + q$ is
 Nilai $p + q$ ialah

- A 90°
- B 180°
- C 270°
- D 360°

Trigonometry

• Sine | Cosine | Tangent

MRSM 2018 – Paper 1 – Q10,11

- 10 In Diagram 5, JKL and LMN are straight lines.
Dalam Rajah 5, JKL dan LMN ialah garis lurus.

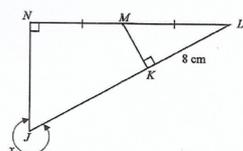


Diagram 5
Rajah 5

Given $\cos \angle KLM = \frac{4}{5}$, find the value of $\tan x$.

Diberi $\cos \angle KLM = \frac{4}{5}$, cari nilai $\tan x$.

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

- 11 Determine the number of intersection point(s) between the graph $y = \sin x$ and $y = \cos x$ for $90^\circ \leq x \leq 360^\circ$. Hence, state the value(s) of x .

Tentukan bilangan titik persilangan antara graf $y = \sin x$ dan $y = \cos x$ bagi $90^\circ \leq x \leq 360^\circ$. Seterusnya, nyatakan nilai x .

	Intersection point(s) Titik persilangan	x
A	1	45°
B	1	225°
C	2	$90^\circ, 180^\circ$
D	2	$45^\circ, 225^\circ$

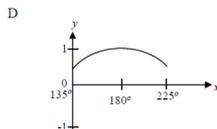
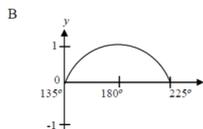
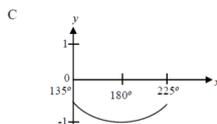
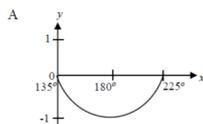
37

Trigonometry

• Sine | Cosine | Tangent

Pahang 2018 – Paper 1 – Q9,10

- 9 Which of the graph represents $y = \cos x^\circ$ for $135^\circ \leq x \leq 225^\circ$?
Graf manakah yang mewakili $y = \cos x^\circ$ bagi $135^\circ \leq x \leq 225^\circ$?



- 10 Diagram 5 shows two right angle triangles RQT and SVU. PQT and SVU are straight lines.
Rajah 5 menunjukkan dua segi tiga bersudut tegak RQT dan SVU. PQT dan SVU adalah garis lurus.

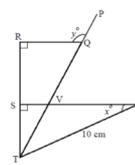


Diagram 5
Rajah 5

Given that $\sin x = \frac{2}{5}$ and $VU = 3 SV$, find $\tan y^\circ$.

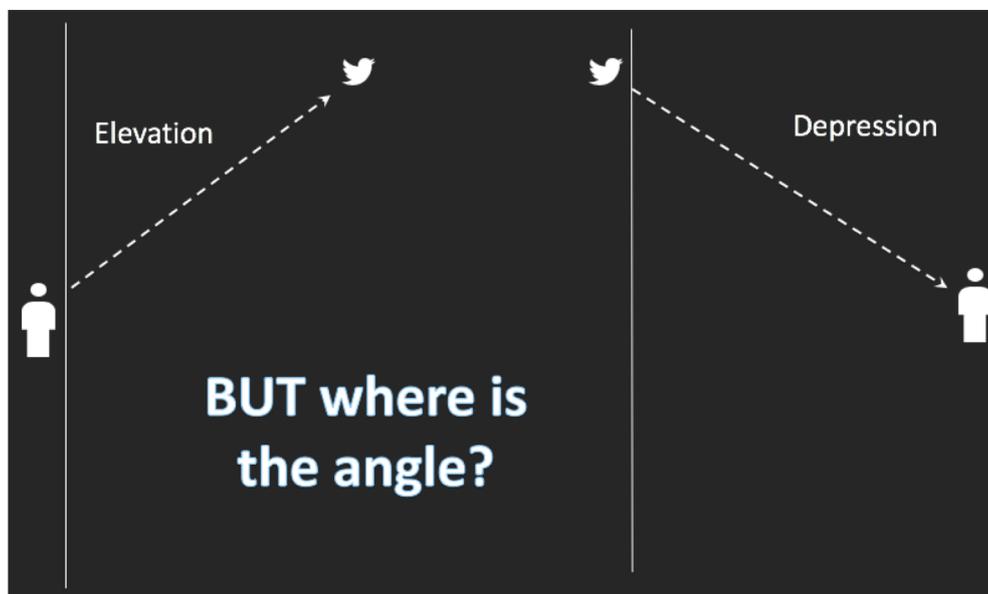
Diberi bahawa $\sin x = \frac{2}{5}$ dan $VU = 3 SV$, cari $\tan y^\circ$.

- A $\frac{1}{6}$
B $\frac{1}{3}$
C 3
D 6

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Angle Elevation & Angle Depression

- Horizontal Line | Concept



Angle Elevation & Angle Depression

- Horizontal Line | Concept

Pahang 2018 – Paper 1 – Q27

- 27 Diagram 12 shows a vertical pole. A rope with bunting flags was tied from the peak of the pole to the point P that lies on the horizontal ground.
Rajah 12 menunjukkan sebatang tiang tegak. Seutas tali dengan bendera bunting diikat dari puncak tiang ke titik P yang terletak pada permukaan tanah mengufuk.

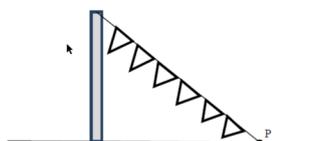


Diagram 12
Rajah 12

Angle of depression of P from the top of the pole is 42° and the horizontal distance of P from the bottom of the pole is 0.8 m. Calculate the length, in m, of the rope.
Sudut tunduk P dari puncak tiang ialah 42° dan jarak mengufuk P dari kaki tiang ialah 0.8 m. Hitung panjang, dalam m, tali tersebut.

- A 0.72
 B 0.89
 C 1.08
 D 1.20

Angle Elevation & Angle Depression

- Horizontal Line | Concept

MRSM 2018 – Paper 1 – Q13

13 Diagram 7 shows the position of a cable car, the cable car station and a bird.
Rajah 7 menunjukkan kedudukan sebuah kereta kabel, stesen kereta kabel dan seekor burung.

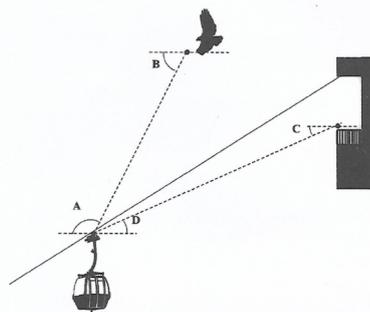


Diagram 7
Rajah 7

Which of the following, A, B, C or D represents the angle of elevation?
Antara A, B, C atau D, yang manakah mewakili sudut dongakan?

41

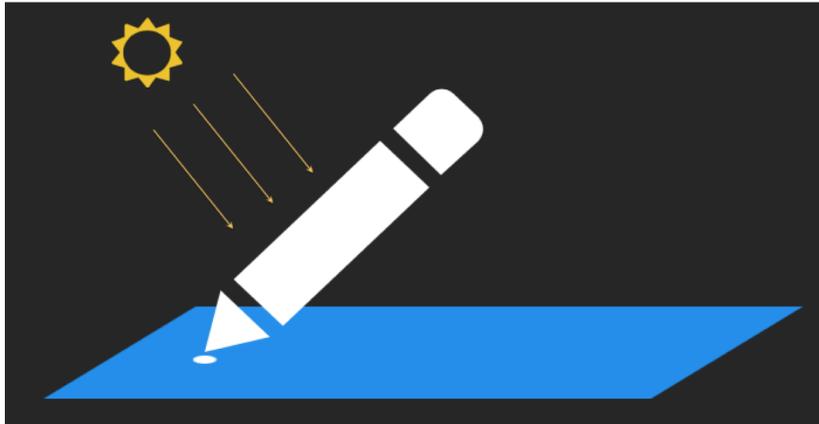
Lines and Planes in 3-Dimension

Orthogonal Projection | Way to find the angle

Lines and Planes in 3-Dimension

43

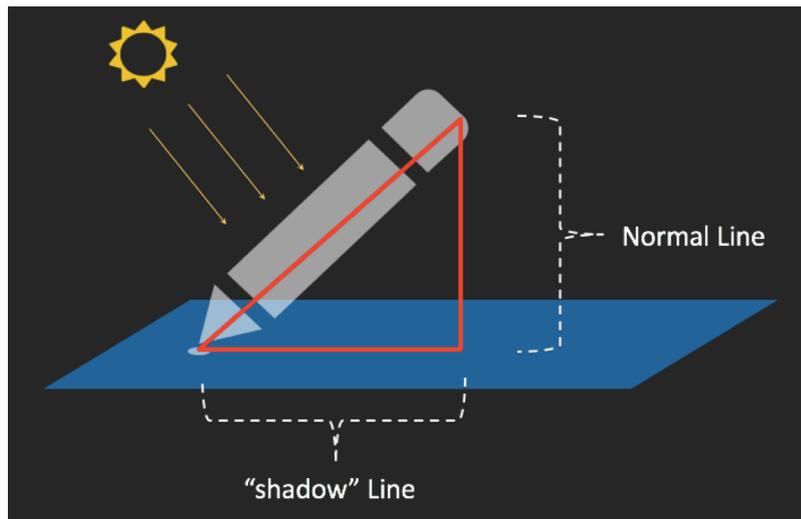
Orthogonal Projection | Way to find the angle



Lines and Planes in 3-Dimension

44

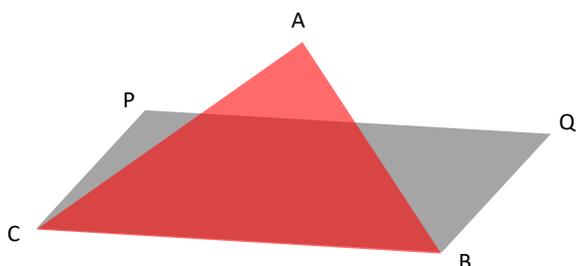
Orthogonal Projection | Way to find the angle



Lines and Planes in 3-Dimension

45

Orthogonal Projection | Way to find the angle



Quick Tips:

1. **Avoid diagonal** (unless it is the "shadow")
2. Always pick the **shortest line** whenever possible.

Lines and Planes in 3-Dimension

46

Orthogonal Projection | Way to find the angle

Terengganu 2018 – Paper 1 – Q15

- 15 Diagram 9 shows a cuboid with a horizontal base $PQRS$ where E , D , T and U are midpoints of AB , CD , PQ and RS respectively.

Rajah 9 menunjukkan sebuah kuboid dengan tapak mengufuk $PQRS$. di mana E , F , T dan U ialah titik-titik tengah bagi AB , CD , PQ dan RS masing-masing.

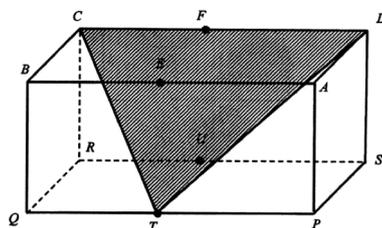


Diagram 9 / Rajah 9

Name the angle between plane CDT and plane $ABCD$.
 Namakan sudut di antara satah CDT dan satah $ABCD$.

- A $\angle FTU$
 B $\angle TFE$
 C $\angle EUT$
 D $\angle UET$

Lines and Planes in 3-Dimension

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Orthogonal Projection | Way to find the angle

Pahang 2018 – Paper 1 – Q11

- 11 Diagram 6 shows a prism $PQRSTU$ on a horizontal plane.
Rajah 6 menunjukkan sebuah prisma $PQRSTU$ pada satah mengufuk.

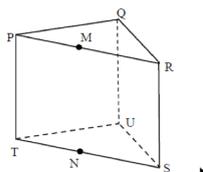


Diagram 6
Rajah 6

State the angle between line QN and plane $PRST$.
Nyatakan sudut antara garis QN dan satah $PRST$.

- A $\angle SNQ$
- B $\angle MNQ$
- C $\angle QNU$
- D $\angle QNP$

Lines and Planes in 3-Dimension

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Orthogonal Projection | Way to find the angle

MRSM 2018 – Paper 1 – Q12

- 12 Diagram 6 shows a solid with the horizontal base $DEFG$.
 $DEIH$, $EFJI$, $FGKJ$ and $DGKH$ are vertical planes.
*Rajah 6 menunjukkan sebuah pepejal dengan tapak mengufuk $DEFG$.
 $DEIH$, $EFJI$, $FGKJ$ dan $DGKH$ ialah satah tegak.*

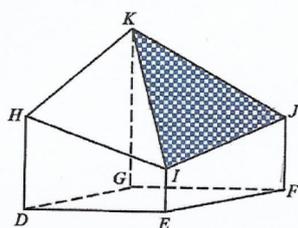


Diagram 6
Rajah 6

Name the angle between the plane KIJ and the plane $FGKJ$.
Namakan sudut di antara satah KIJ dengan satah $FGKJ$.

- A $\angle GKI$
- B $\angle IJF$
- C $\angle GJI$
- D $\angle IKF$

Lines and Planes in 3-Dimension

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Orthogonal Projection | Way to find the angle

MRSM 2018 – Paper 2 – Q8

- 8 Diagram 8 shows a pyramid with a horizontal regular pentagon base $IJKLM$ with sides 12 cm. V is the peak of the pyramid and it is 23 cm vertically above point K .

Rajah 8 menunjukkan sebuah piramid dengan tapak mengufuk pentagon sekata $IJKLM$ dengan sisi 12 cm. V ialah puncak piramid dan berada 23 cm tegak di atas titik K .

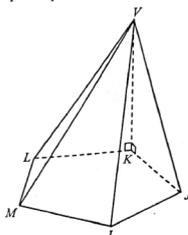


Diagram 8
Rajah 8

Given that $MK = IK = 9.4$ cm. LVM , MVI and IVJ are inclined.
Diberi bahawa $MK = IK = 9.4$ cm. LVM , MVI dan IVJ ialah satah condong.

- (a) Name the angle between the line VM and the plane $IJKLM$.
Namakan sudut antara garis VM dan satah $IJKLM$.
- (b) Hence, calculate the angle between the line VM and the plane $IJKLM$.
Seterusnya, hitung sudut antara garis VM dan satah $IJKLM$.

[3 marks]
[3 markah]

Lines and Planes in 3-Dimension

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Orthogonal Projection | Way to find the angle

Perlis 2018 – Paper 2 – Q4

- 4 Diagram 2 shows a camping tent in the shape of a right prism set up by Rafizi on the horizontal ground. The tent has a rectangular base $ABCD$. The vertical poles EG and FH with height of 1.5 m are located at the midpoints of AB and DC respectively.

Rajah 2 menunjukkan sebuah khemah yang berbentuk prisma tegak yang dibina oleh Rafizi pada tanah mengufuk. Khemah itu mempunyai tapak segi empat tepat $ABCD$. Tiang tegak EG dan FH yang setinggi 1.5 m masing-masing terletak di titik tengah bagi AB dan DC .

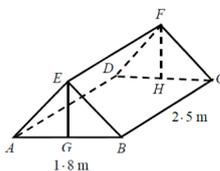


Diagram 2
Rajah 2

- (a) Name the angle between the plane FBG and the base $ABCD$.
Namakan sudut di antara FBG dengan tapak $ABCD$.
- (b) Hence calculate the angle between the plane FBG and the base $ABCD$.
Seterusnya, hitung sudut di antara FBG dengan tapak $ABCD$.

[3 marks]
[3 markah]

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?