

Penyelesaian Lengkap

Ujian Akhir Sesi Akademik

Bahagian A

$$1 \quad (m^2k^3)^2 \times m^3 \div k^4 = m^4 \times k^6 \times m^3 \div k^4 \\ = m^{4+3}k^{6-4} \\ = m^7k^2$$

Jawapan/Answer: A

$$2 \quad x^2 = 8^{\frac{4}{3}} \div 4^{-1} \\ = (2^3)^{\frac{4}{3}} \div 2^{-2} \\ = 2^{4-(-2)} \\ = 2^6 = (2^3)^2 \\ x = 2^3 = 8$$

Jawapan/Answer: B

- 3 Sifar yang terletak di akhir nombor bulat adalah tidak bererti.

Zeros that lie at the end of a whole number are not significant.

Jawapan/Answer: C

$$4 \quad 1.2 \times 10^{-7} - 8.2 \times 10^{-8} \\ = 12 \times 10^{-8} - 8.2 \times 10^{-8} \\ = 3.8 \times 10^{-8}$$

Jawapan/Answer: B

- 5 $I = Prt$

$$\text{Kadar faedah/Interest rate} = \frac{35\,000}{500\,000 \times 2.5} = 0.028 \\ r = 2.8$$

Jawapan/Answer: D

$$6 \quad MV = 80\,000 \left(1 + \frac{0.032}{4}\right)^{4 \times 3} = \text{RM}88\,027.10$$

$$\text{Faedah/Interest} = \text{RM}88\,027.10 - \text{RM}80\,000 \\ = 8027.10$$

Jawapan/Answer: C

- 7 Jawapan/Answer: D

- 8 Sisi segi empat sama yang sebenar/Side of actual square = $8 \times 5 = 40$

$$\text{Luas segi empat sama yang sebenar/Area of actual square} = 40 \times 40 = 1\,600 \text{ cm}^2$$

Jawapan/Answer: A

- 9 5, 12, 13 ialah trirangkap

Pythagoras

5, 12, 13 is a Pythagorean triple

$$\tan \theta = \frac{12}{5}$$

Jawapan/Answer: C

$$10 \quad \cos x = \frac{10}{AC} = \frac{2}{3}$$

$$AC = 15 \text{ cm}$$

$$\sin y = \frac{CD}{AC} = \frac{4}{5}$$

$$CD = \frac{4}{5} \times 15 = 12 \text{ cm}$$

Jawapan/Answer: C

- 11 Sudut dongak A dari C = $\angle BCA = 58^\circ$
Angle of elevation of A from C = $\angle BCA = 58^\circ$
Sudut tunduk C dari A ialah 58
Angle of depression of C from A is 58°
 $\therefore \angle CAD = 58^\circ - 42^\circ = 16^\circ$

Jawapan/Answer: B

- 12 $\angle AOC$ major = $2 \times 126^\circ = 252^\circ$
 $\angle AOC$ minor = $360^\circ - 252^\circ = 108^\circ$

$$x = \frac{1}{2}(180^\circ - 108^\circ) = 36^\circ$$

Jawapan/Answer: C

- 13 $\angle PQR = \frac{1}{2} \times 2y = y$

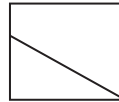
$$\angle ORQ = \angle OQR = y$$

$$3y = 90^\circ$$

$$y = 30^\circ$$

Jawapan/Answer: A

- 14 Bentuk pelan ialah
The shape of the plan is



Jawapan/Answer: B

- 15 Bentuk dongakan sisi pada satah mencancang yang selari dengan QR seperti yang dilihat dari X ialah
The shape of the side elevation on a vertical plane parallel to QR as viewed from X is



Jawapan/Answer: C

- 16 Pergerakan sebiji bola sepak apabila ditendang tinggi ke tengah padang adalah bukan lengkok bulatan.
not an arc of a circle.
The movement of a football when it is kicked high to the centre of the field is

Jawapan/Answer: C

- 17 Jawapan/Answer: A

18 Kecerunan/Gradient = $-\left(\frac{-2}{6}\right) = -\left(\frac{4}{-\left(\frac{2}{p}\right)}\right)$

$$\frac{1}{3} = \frac{4p}{2}$$

$$p = \frac{1}{6}$$

Jawapan/Answer: D

19 $3x + 2y + 12 = 0$

$$y = -\frac{3}{2}x - 6 \rightarrow m = -\frac{3}{2}$$

$$-2 = -\frac{3}{2}(6) + c$$

$$c = -2 + 9 = 7$$

$$y = -\frac{3}{2}x + 7$$

Jawapan/Answer: D

20 $2x + 5y = 10$

$$2(-6) + 5w = 10$$

$$5w = 10 + 12 = 22$$

$$w = \frac{22}{5} = 4\frac{2}{5}$$

Jawapan/Answer: B

Bahagian B

1 (a) $a^{10} \times a^{-2} = a^{10+(-2)} = a^8$

$$\frac{a^5}{a^{-3}} = a^{5-(-3)} = a^{5+3} = a^8$$

$a^{16} \times a^2$	$a^{10} \times a^{-2}$	$(a^4)^4$
$a^4 \times a^2$	$\left(\frac{a^8}{a^2}\right)^2$	$\frac{a^5}{a^{-3}}$

(b) $7.36 \times 10^{-2} \text{ km} = 7.36 \times 10^{-2} \times 10^3 \text{ m}$
 $= 7.36 \times 10^1 \text{ m} = 73.6 \text{ m}$
 $7.36 \times 10^4 \text{ mm} = 7.36 \times 10^4 \times 10^{-3} \text{ m}$
 $= 7.36 \times 10^1 \text{ m} = 73.6 \text{ m}$

$7.36 \times 10^5 \text{ mm}$	$7.36 \times 10^2 \text{ cm}$	$7.36 \times 10^{-2} \text{ km}$
$7.36 \times 10^4 \text{ mm}$	$7.36 \times 10^{-3} \text{ km}$	$7.36 \times 10^4 \text{ cm}$

2 (a) Pemegang saham menerima kadar divident yang tetap setiap tahun.

The shareholder earns a fixed dividend rates per year.



Pemegang saham mempunyai keutamaan dalam pembahagian harta jika syarikat dibubarkan.

The shareholder has the priority in the distribution of property if the company is liquidated.



(b) (i) Skala/Scale = $\frac{64}{8} = \frac{8}{1} = \frac{1}{\left(\frac{1}{8}\right)} = 1 : \frac{1}{8}$

(ii) Skala/Scale = $\frac{3}{12} = \frac{1}{4} = 1 : 4$

3 (a) $8 \cos 60^\circ + 3 \tan 45^\circ (\tan 30^\circ)^2$

$$= 8\left(\frac{1}{2}\right) + 6(1)\left(\frac{1}{\sqrt{3}}\right)^2$$

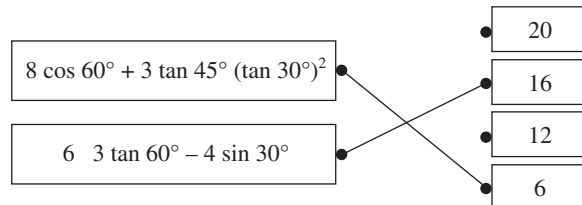
$$= 4 + 2$$

$$= 6$$

$$6\sqrt{3} \tan 60^\circ - 4 \sin 30^\circ = 6\sqrt{3}(\sqrt{3}) - 4\left(\frac{1}{2}\right)$$

$$= 18 - 2$$

$$= 16$$



(b) $\angle DCE = \angle EDQ = 55^\circ$

$$\angle OAB = \angle DCO = 55^\circ$$

$$\angle COD = 180^\circ - 55^\circ - 55^\circ = 70^\circ$$

$$\angle CED = 55^\circ$$

$$\angle OAB = 55^\circ$$



$$\angle COD = 70^\circ$$



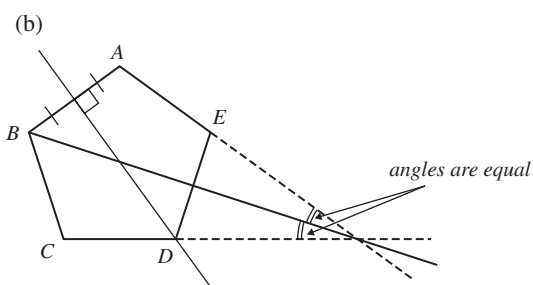
$$\angle CDP = 55^\circ$$



4 (a)

Bentuk dongakan depan pada satah mencancang yang selari dengan JK seperti yang dilihat dari X.
The shape of the front elevation on a vertical plane parallel to JK as viewed from X.

Pelan/Plan



- (i) Lokus titik yang sama jarak dari A dan B melalui titik D.
The locus of points that are equidistant from A and B passes through the point D.

B C (D) E

- (ii) Lokus titik yang sama jarak dari garis AE dan CD melalui titik B.
The locus of points that are equidistant from the lines AE and CD passes through the point B.

(B) C D E

5 (a) $3x + 6y - 12 = 0$

$$6y = -3x + 12$$

$$y = -\frac{1}{2}x + 2$$

Kecerunan // The gradient of $l = -\frac{1}{2}$

(b) $3x + 6y - 12 = 0$

$$3x + 6y = 12$$

$$\frac{x}{4} + \frac{y}{2} = 1$$

Pintasan-y bagi // The y-intercept of $l = 2$

(c) Pintasan-x bagi // The x-intercept of $l = 4$

(d) $3x + 6y - 12 = 0$

$$3h + 6(-3) - 12 = 0$$

$$3h = 30$$

$$h = 10$$

Bahagian C

1 (a) $b^4 = 27^{\frac{5}{3}} \div 9^{-\frac{3}{2}}$

$$b^4 = (3^3)^{\frac{5}{3}} \div (3^2)^{-\frac{3}{2}} = 3^{5 - (-3)} = 3^8$$

$$= (3^2)^4$$

$$b = 9$$

(b) $\frac{512^{\frac{2}{3}} \times 81^{\frac{1}{2}}}{36^{\frac{3}{2}}} = \frac{(2^9)^{\frac{2}{3}} \times (3^4)^{\frac{1}{2}}}{(6^2)^{\frac{3}{2}}}$

$$= \frac{2^6 \times 3^2}{6^3}$$

$$= \frac{2^6 \times 3^2}{2^3 \times 3^3}$$

$$= \frac{2^3}{3}$$

$$= \frac{8}{3}$$

(c) $(256 \times 10^{-6}) \div (8 \times 10^3)$
 $= (256 \div 8) \times (10^{-6} \div 10^3)$
 $= 32 \times 10^{-6-3}$
 $= 3.2 \times 10^{-8}$

(d) $180 \text{ hari/days} = 180 \times 24 \times 60 \times 60 = 15\,552\,000$
 $= 1.5552 \times 10^7 \text{ saat/seconds}$

Jarak dilalui/Distance travelled
 $= 2.98 \times 10^8 \times 1.5552 \times 10^7$
 $= 4.634496 \times 10^{15} \text{ m}$
 $= 4.634496 \times 10^{12} \text{ km}$
 $= 4.63 \times 10^{12} \text{ km}$ [3 angka bererti/3 significant figures]

2 (a) Pendapatan selama 5 tahun/Income for 5 years

$$= \text{RM}1\,600 \times 12 \times 5 = \text{RM}96\,000$$

Keuntungan modal/Capital gain

$$= \text{RM}450\,000 - \text{RM}300\,000 = \text{RM}150\,000$$

Jumlah pulangan pelaburan/Total return on investment

$$= \text{RM}96\,000 + \text{RM}150\,000$$

$$= \text{RM}246\,000$$

(b) Bayaran minimum/Minimum payment

$$= 0.05 \times \text{RM}2\,000 = \text{RM}100$$

Baki tertunggak/*Outstanding balance*

$$= \text{RM}2\,000 - \text{RM}100 = \text{RM}1\,900$$

Faedah atas baki/*Interest on balance*

$$= \frac{0.18}{12} \times \text{RM}1\,900 = \text{RM}28.50$$

Bayaran bulan hadapan

Payment for the following month

$$= \text{RM}1\,900 + \text{RM}28.50$$

$$= \text{RM}1\,928.50$$

(c) (i) $\text{Skala/Scale} = \frac{8}{4\,000} = \frac{1}{500} = 1 : 500$

(ii) Lebar sebenar tanah A

The actual width of plot A

$$= 6 \times 500 \text{ m}$$

$$= 30 \text{ m}$$

(iii) Lebar sebenar tanah B

The actual width of plot B

$$= 5 \times 500 \text{ m}$$

$$= 25 \text{ m}$$

Panjang sebenar bidang tanah B

The actual length of plot B

$$= 12 \times 500 \text{ m}$$

$$= 60 \text{ m}$$

Luas sebenar bidang tanah B

The actual area of plot B

$$= 25 \times 60 \text{ m}^2$$

$$= 1\,500 \text{ m}^2$$

3 (a) (i) $\tan \theta = 1.58$

$$\theta = \tan^{-1}(1.58)$$

$$= 57.6698$$

$$= 57^\circ 40'$$

(ii) $\sin \theta = 0.436$

$$\theta = \sin^{-1}(0.436)$$

$$= 25.8489$$

$$= 25^\circ 51'$$

(iii) $\cos \theta = 0.1834$

$$\theta = \cos^{-1}(0.1834)$$

$$= 79.4321$$

$$= 79^\circ 26'$$

(b) $\frac{30}{BC} = \tan 58^\circ$

$$BC = \frac{30}{\tan 58^\circ} = 18.746 \text{ m}$$

$$\angle BAC = 90^\circ - 58^\circ = 32^\circ$$

$$\frac{BD}{30} = \tan 65^\circ$$

$$BD = 30 \tan 65^\circ = 64.335 \text{ m}$$

$$CD = 64.335 - 18.746$$

$$= 45.59 \text{ m}$$

(c) (i) $AQ = \sqrt{8^2 + 10^2}$

$$= 12.806 \text{ cm}$$

(ii) $\triangle APQ$ dan $\triangle BRQ$ adalah serupa.

$\triangle APQ$ dan $\triangle BRQ$ are similar.

$$\frac{QR}{6} = \frac{PQ}{8}$$

$$QR = \frac{10}{8} \times 6$$

$$= 7.5 \text{ cm}$$

(iii) $BQ = \sqrt{6^2 + 7.5^2}$

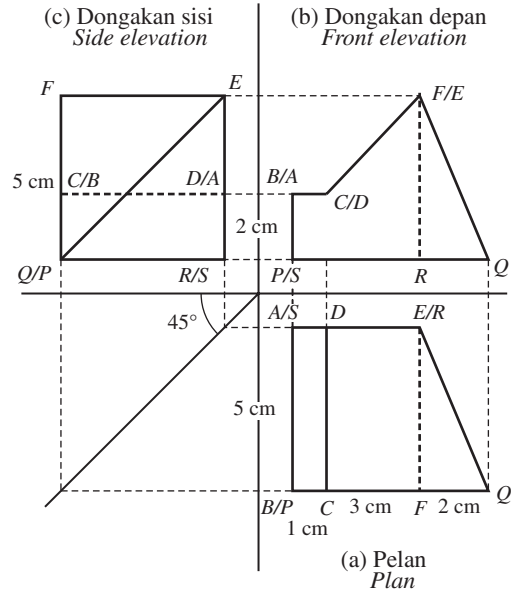
$$= 9.605 \text{ cm}$$

$$AB = AQ + QB$$

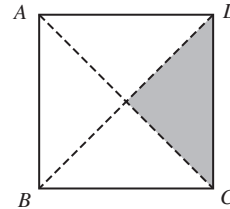
$$= 12.806 + 9.605$$

$$= 22.41 \text{ cm}$$

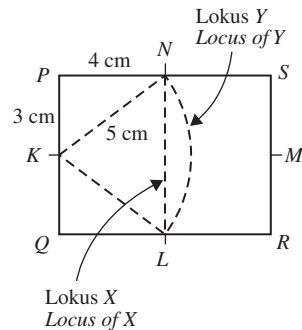
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5 (a)



(b)



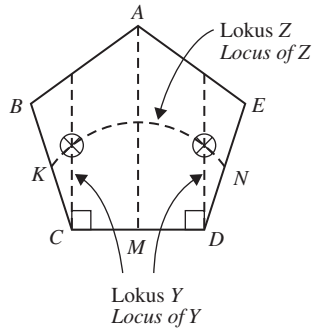
(i) Lokus X ialah garis lurus LN yang sama jarak dari titik Q dan R.

The locus of point X is the straight line LN which is equidistant from the points Q and R.

(ii) Lokus Y ialah lengkok bulatan, NL berpusat dengan jejari 5 cm.

The locus of point Y is the arc of the circle, NL with centre K and radius 5 cm.

(c)



6 $2y + x - 12 = 0$

(a) Melalui/Passes through $(h, 2)$

Gantikan/Substitute $x = h, y = 2$:

$$4 + h - 12 = 0$$

$$h = 8$$

(b) $2y + x = 12$

$$\frac{x}{12} + \frac{y}{6} = 1$$

$$\begin{aligned} \text{Kecerunan/Gradient of } AD &= -\left(\frac{6}{12}\right) \\ &= -\frac{1}{2} \end{aligned}$$

(c) Pintasan- x /x-intercept = 12

Persamaan CD /Equation of CD :

$$x = 12$$

(d) Pintasan- y /y-intercept = 6

\therefore Koordinat/Coordinates of $A = (0, 6)$

(e) Kecerunan/Gradient of $AB = \frac{6-0}{0-(-3)} = 2$

Persamaan AB /Equation of AB :

$$y = 2x + 6$$

(f) $3y + x + 24 = 0$

Gantikan/Substitute $y = 2x + 6$

$$3(2x + 6) + x + 24 = 0$$

$$6x + 18 + x + 24 = 0$$

$$7x = -42$$

$$x = -6$$

Gantikan/Substitute $x = -6$ ke dalam/into

$$y = 2x + 6$$

$$y = 2(-6) + 6 = -6$$

\therefore Koordinat/Coordinates of $B = (-6, -6)$