

SIR VEN

(GURU ADIWIRA KEBANGSAAN 2019)

SPM 2023

SOALAN RAMALAN
MATEMATIK TAMBAHAN
KERTAS 2

SISTEM PERSAMAAN
SYSTEM EQUATIONS





Selesaikan persamaan serentak berikut:

Solve the following simultaneous equations:

$$4x - 3y + z = -10 \quad , \quad 2x + y + 3z = 0 \quad , \quad -x + 2y - 5z = 17$$



Jarak di antara rumah Ahmad dan adiknya, Aimi ialah 100 km. Pada suatu hari, Ahmad memandu dari rumahnya ke rumah adiknya dengan laju purata x km/j dan kembali dengan laju purata y km/j. Jumlah masa untuk kedua-dua perjalanan ialah 2.5 jam. Diberi bahawa x melebihi y sebanyak 20 km/j. Cari masa yang diambil oleh Ahmad untuk pergi ke rumah adiknya. Berikan jawapan kepada 3 angka bererti.

The distance between Ahmad's house and his sister, Aimi's is 100 km. On a certain day, Ahmad drives to his sister's house with an average speed of x km/h and returns home with an average speed of y km/h. The total time taken for the two journey is 2.5 hours. Given that x is 20 km/h more than y . Find the time taken by Ahmad to go to his sister's house. Give your answers correct to 3 significant figures.

Gunakan / Use

$$\text{Laju} = \frac{\text{Jarak}}{\text{Masa}}$$

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$



Selesaikan persamaan serentak yang berikut:
Solve the following simultaneous equations:

$$2y = -2x - 10 \quad \text{dan / and} \quad 2y^2 + x = 5$$



Sarah, Aisyah dan Marina membeli beberapa barang untuk persiapan Hari Raya. Sarah membeli 3 pek coklat masakan, 2 pek kurma dan sekotak gula-gula dengan harga kurang RM21 berbanding harga yang dibayar oleh Aisyah. Aisyah membeli 4 pek coklat masakan, 3 pek kurma dan sekotak gula-gula dengan harga RM77 manakala Marina pula membeli 6 pek coklat masakan, satu pek kurma dan 4 kotak gula-gula dengan harga lebih RM27 berbanding perbelanjaan Sarah. Cari harga seunit bagi setiap jenis barang yang dibeli.

[7 markah]

Sarah, Aisyah and Marina bought some items in preparation for Hari Raya. Sarah bought 3 packs of cooking chocolates, 2 packs of dates and a box of sweets for less than RM21 compared to the price paid by Aisyah. Aisyah bought 4 packs of cooking chocolates, 3 packs of dates and a box of sweets for RM77 while Marina bought 6 packs of cooking chocolates, a pack of dates and 4 boxes of sweets for more than RM27 compared to Sarah's expenses. Find the unit price for each type of items purchased.



Sebuah bakeri membuat tiga jenis kek dengan kos bulanan RM 8050 untuk 250 biji kek. Kos untuk membuat sebiji kek coklat, kek marble dan kek red velvet masing-masing RM 30, RM 20 dan RM 40. Harga jualan bagi sebiji kek coklat, kek marble dan kek red velvet ialah RM 35, RM 25 dan RM 50. Jika bakeri itu ingin memperoleh keuntungan sebanyak RM 1780 setiap bulan, berapakah bilangan setiap jenis kek yang perlu dibuat? [7 marks]

A bakery bakes three types of cakes at a monthly cost of RM 8050 for 250 cakes. The cost to bake a chocolate cake, marble cake and red velvet cake is RM 30, RM 20 and RM 40 respectively. The selling price for a chocolate cake, marble cake and red velvet cake is RM 35, RM 25 and RM 50. If the bakery wants to make a profit of RM 1780 per month, how many cakes of each type should be made? [7 marks]



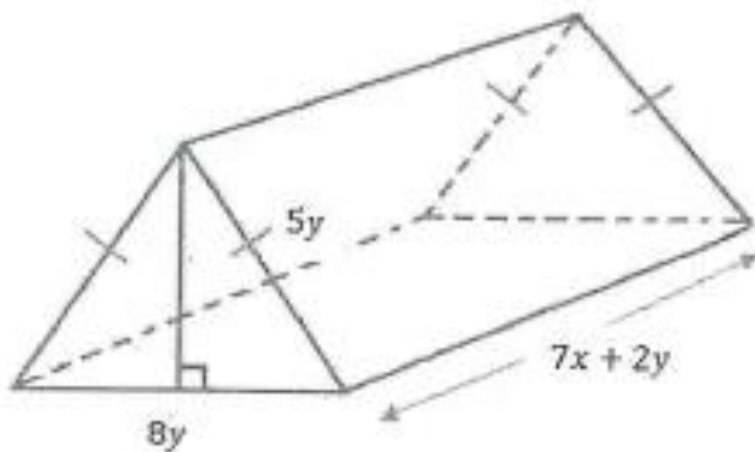
Selesaikan persamaan serentak $4x + y = 3xy - 5y + 2x^2 = 3$.

Solve the simultaneous equation $4x + y = 3xy - 5y + 2x^2 = 3$.



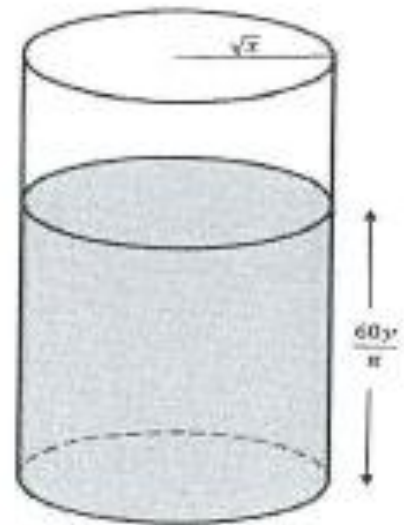
Syarikat Anna ingin menghasilkan suatu jenis coklat dengan menggunakan acuan berbentuk prisma seperti dalam Rajah 2(a). Ramuan coklat telah disediakan dalam bekas berbentuk silinder seperti dalam Rajah 2(b).

Company Anna wants to produce a kind of chocolate with a mold in prism shape as shown in Diagram 2(a). Ingredient of the chocolate was provided in a cylindrical container as shown in Diagram 2(b).



Rajah 2(a)

Diagram 2(a)



Rajah 2(b)

Diagram 2(b)

Diberi jumlah ukuran sisi acuan coklat ialah 84 cm, cari nilai x dan nilai y .

Given the total measurement of side of the mold is 84 cm, find the value of x and of y .

[6 markah]

[6 marks]



Rajah 1 menunjukkan harga bagi tiga set kuih.

Diagram 1 shows the price of three sets of kueh.



Rajah 1

Diagram 1

Harga bagi 2 biji karipap, sebiji donat dan 3 ketul nugget ialah RM 2.80 dan harga bagi sebiji karipap, 2 biji donat dan 4 ketul nugget ialah RM 3.30. Jika seorang membeli 3 biji karipap, 4 biji donat dan seketul nugget, maka dia perlu membayar RM 4.30. Ahmad membeli 3 biji karipap, 3 biji donat dan 2 ketul nugget, berapakah yang perlu Ahmad bayar?

[7 markah]

The price of 2 curry puffs, a doughnut and 3 nuggets are RM 2.80 and the price of the curry puff, 2 doughnuts and 4 nuggets are RM 3.30. If a person buys 3 curry puffs, 4 doughnuts and a nugget, then he needs to pay RM 4.30. Ahmad buys 3 curry puffs, 3 doughnuts and 2 nuggets, how much does Ahmad have to pay?

[7 marks]



YIK

Hapus anu pertama dengan penggantian @ penghapusan

Hapus anu kedua dengan penggantian @ penghapusan

$$x = 1$$

$$y = 4$$

$$z = -2$$

SBP

$$\begin{aligned} \text{I} \quad & \frac{100}{x} + \frac{100}{y} = 2.5 \\ & x = 20 + y \\ & 40y + 40(20 + y) = y(20 + y) \quad \text{follow 1} \\ & y = \frac{-(-60) \pm \sqrt{(-60)^2 - 4(1)(-800)}}{2} \\ & y = 71.23, y = -11.23 \\ & x = 91.23, x = +8.77 \quad 8.77 \\ & \text{Masa} = 1.10 \text{ saat} \end{aligned}$$

MRSM

Method: Substitution

$$y = -x - 5 \quad \text{or} \quad x = -y - 5$$

$$2^2(-x-5)^2 + x = 5 \quad \text{or} \quad 2y^2 + (-y-5) = 5$$

$$x = -\frac{15}{2}, x = -3 \quad @ \quad y = \frac{5}{2}, y = -2$$

$$y = \frac{5}{2}, y = -2 \quad \text{and} \quad x = -\frac{15}{2}, x = -3$$

SABK S1

Katakan x =coklat, y =kurma, z =gula-gula

$$\begin{aligned} 3x + 2y + z = 56 \quad @ \quad 6x + y + 4z = 83 \\ 2 \text{ penyelesaian menghapus/ mengganti pembolehubah} \\ \text{Mana-mana satu perkara rumus satu pembolehubah} \\ x = 6, y = 15, z = 8 \end{aligned}$$

PENGAMIRAN
JAWAPAN



SABK S3

$x = \text{kek coklat}, y = \text{kek marble}, z = \text{kek red velvet}$
 $x + y + z = 250 \dots\dots\dots(1)$

$30x + 20y + 40z = 8050 \text{ or } 3x + 2y + 4z = 805 \dots\dots(2)$

$5x + 5y + 10z = 1780 \text{ or } x + y + 2z = 356 \dots\dots\dots(3)$

Kaedah penghapusan

$(3) - (1)$

$x + y + 2z = 356$

$(-) x + y + z = 250$

$z = 106$

$(3) \times 2 \rightarrow 2x + 2y + 4z = 712 \dots\dots\dots(4)$

$(2) - (4)$

$3x + 2y + 4z = 805$

$(-) 2x + 2y + 4z = 712$

$x = 93$

$93 + y + 106 = 250$

$y = 51$

kek coklat=93 biji, kek marble = 51 biji, kek red velvet = 106 biji

MIMS S1

$y = 3 - 4x$

$3x(3 - 4x) - 5(3 - 4x) + 2x^2 = 3$

$10x^2 - 29x + 18 = 0$

$(10x - 9)(x - 2) = 0$

$x = 2, \frac{9}{10}$

$y = -5, -\frac{3}{5}$

or

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

$3\left(\frac{3 - y}{4}\right)y - 5y + 2\left(\frac{3 - y}{4}\right)^2 = 3$

$5y^2 + 28y + 15 = 0$

$(5y + 3)(y + 5) = 0$

$y = -5, -\frac{3}{5}$

$x = 2, \frac{9}{10}$

MIMS S2

$4(5y) + 2(8y) + 3(7x + 2y) = 84$

$\left(\frac{1}{2} \times 8y \times 3y\right)(7x + 2y) = \pi(\sqrt{x})^2 \left(\frac{60y}{\pi}\right)$

$x = 4 - 2y$

$7xy + 2y^2 = 5x$

$7(4 - 2y)y + 2y^2 = 5(4 - 2y)$

$-12y^2 + 38y - 20 = 0$

$6y^2 - 19y + 10 = 0$

$(2y - 5)(3y - 2) = 0$

$y = \frac{5}{2}, y = \frac{2}{3}$

$x = -1, x = \frac{8}{3}$

$y = \frac{2}{3}, x = \frac{8}{3}$

MIMS S3

$2x + y + 3z = 2.80 \rightarrow (1)$

$x + 2y + 4z = 3.30 \rightarrow (2)$

$3x + 4y + z = 4.30 \rightarrow (3)$

Menggunakan kaedah penggantian:

$y = 2.8 - 2x - 3z$

Gantikan $y = 2.8 - 2x - 3z$ dalam persamaan (2) dan (3)

$-3x - 2z = -2.3$ dan $-5x - 11z = -6.9$

selesaikan persamaan

$x = 0.50$

$y = 0.60, z = 0.40$

$3(0.50) + 3(0.60) + 2(0.40) = \text{RM}4.10$