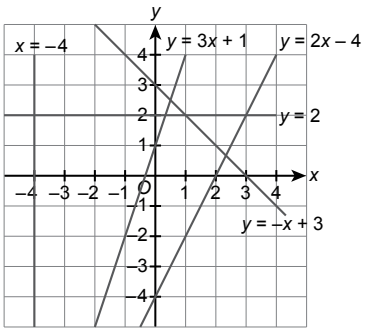
# JAWAPAN

## BAB 9 Garis Lurus
*Straight Lines*

**1.**

| Fungsi linear *Linear function* | Kecerunan *Gradient* | Pintasan-*y* *y-intercept* |
|---|---|---|
| $x = -4$ | $\infty$ | Tiada / *None* |
| $y = 2$ | 0 | 2 |
| $y = -x + 3$ | –1 | 3 |
| $y = 3x + 1$ | 3 | 1 |
| $y = 2x - 4$ | 2 | –4 |




(a) Graf untuk fungsi linear, $y = mx + c$ ialah satu garis lurus.

*The graph of a linear function, $y = mx + c$ is the straight line.*

(b) Diberi suatu persamaan garis lurus dalam bentuk $y = mx + c$, $m$ ialah kecerunan dan $c$ ialah pintasan-$y$.

*Given an equation of a straight line in the form of $y = mx + c$, $m$ is the gradient and $c$ is the y-intercept.*

(c) $x = -4$ ialah satu garis lurus yang selari dengan paksi-$y$.

*$x = -4$ is a straight line that is parallel to y-axis.*

(d) $y = 2$ ialah satu garis lurus yang selari dengan paksi-$x$.

*$y = 2$ is a straight line that is parallel to x-axis.*

**2.**

$y = 4x - 5$ Seperti *as* $y = \frac{2}{5}x + 2$ Seperti *as* $y = -2x + \frac{1}{2}$

(a) 4 (b) $\frac{2}{5}$ (c) –2

$y = -7x - 2$ Seperti *as* $y = \frac{1}{2}x + 15$ Seperti *as* $y = \frac{5}{3}x - \frac{2}{3}$

(d) –2 (e) 15 (f) $-\frac{2}{3}$

**3.** (a) $k = -1$
$h = -3$

(b) $k = -4$
$h = 2$

**4.** (a) $ax + by = c$

$by = -a\,x + c$

$y = -\frac{a}{b}x + \frac{c}{b}$

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

$bx + ay = ab$

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

(c) $by + c = ax$

$by = ax - c$

$y = \frac{a}{b}x - \frac{c}{b}$

**5.** (a)

| **Persamaan garis lurus** *Equation of straight line* | **Kecerunan** *Gradient* | **Pintasan-*y*** *y-intercept* |
|---|---|---|
| (a) $x + y = 4$ | $-1$ | 4 |
| (b) $5x - y = -7$ | 5 | 7 |
| (c) $x + 6y = -1$ | $-\frac{1}{6}$ | $-\frac{1}{6}$ |
| (d) $2x + y = 7$ | $-2$ | 7 |
| (e) $3x - 4y = 2$ | $\frac{3}{4}$ | $-\frac{1}{2}$ |
| (f) $14x - y = -6$ | 14 | 6 |

**6.**

| | **Pintasan-*x*** *x-intercept* | **Pintasan-*y*** *y-intercept* | **Kecerunan** *Gradient* |
|---|---|---|---|
| (a) | 3 | 2 | $-\frac{2}{3}$ |
| (b) | $-1$ | 5 | 5 |
| (c) | 6 | $-1$ | $\frac{1}{6}$ |
| (d) | 2 | 6 | $-3$ |
| (e) | $-7$ | 1 | $\frac{1}{7}$ |
| (f) | $-1$ | $-3$ | $-3$ |

**7.**

| **Bentuk persamaan garis lurus** *Form of equation of straight line* | | |
|---|---|---|
| $ax + by = c$ | $\frac{x}{a} + \frac{y}{b} = 1$ | $y = mx + c$ |
| $\frac{1}{3}x + y = 2$ | $\frac{x}{6} + \frac{y}{2} = 1$ | $y = -\frac{1}{3}x + 2$ |
| $3x - 8y = 5$ | $\frac{3x}{5} - \frac{8y}{5} = 1$ | $8y = 3x - 5$<br>$y = \frac{3}{8}x - \frac{5}{8}$ |
| $5x + 3y = 2$ | $\frac{5x}{2} + \frac{3y}{2} = 1$ | $3y = -5x + 2$<br>$y = -\frac{5}{3}x + \frac{2}{3}$ |
| $x - \frac{1}{2}y = 2$ | $\frac{x}{2} - \frac{y}{4} = 1$ | $\frac{1}{2}y = x - 2$<br>$y = 2x - 4$ |
| $2x - \frac{5}{6}y = -3$ | $-\frac{2x}{3} + \frac{5y}{18} = 1$ | $\frac{5}{6}y = 2x + 3$<br>$y = \frac{12}{5}x + \frac{18}{5}$ |

| **Bentuk persamaan garis lurus** *Form of equation of straight line* | | |
|---|---|---|
| $\frac{x}{a} + \frac{y}{b} = 1$ | $ax + by = c$ | $y = mx + c$ |
| $-\frac{3x}{2} + \frac{y}{2} = 1$ | $-3x + y = 2$ | $y = 3x + 2$ |
| $-\frac{3x}{11} + \frac{9y}{44} = 1$ | $-12x + 9y = 44$ | $9y = 12x + 44$<br>$y = \frac{4}{3}x + \frac{44}{9}$ |
| $\frac{8x}{7} + \frac{2y}{7} = 1$ | $8x + 2y = 7$ | $2y = -8x + 7$<br>$y = -4x + \frac{7}{2}$ |
| $-\frac{x}{2} - \frac{y}{6} = 1$ | $-3x - y = 6$ | $y = -3x - 6$ |
| $-\frac{x}{2} + \frac{y}{4} = 1$ | $-2x + y = 4$ | $y = 2x + 4$ |

**8.**

| **Bentuk persamaan garis lurus** *Form of equation of straight line* | | |
|---|---|---|
| $y = mx + c$ | $ax + by = c$ | $\frac{x}{a} + \frac{y}{b} = 1$ |
| $y = 4x + 9$ | $-4x + y = 9$ | $-\frac{4x}{9} + \frac{y}{9} = 1$ |
| $y = 7x + 3$ | $-7x + y = 3$ | $-\frac{7x}{3} + \frac{y}{3} = 1$ |
| $y = \frac{10}{3}x + 5$ | $-10x + 3y = 15$ | $-\frac{2x}{3} + \frac{y}{5} = 1$ |
| $y = -\frac{5}{3}x + \frac{8}{3}$ | $5x + 3y = 8$ | $\frac{5x}{8} + \frac{3y}{8} = 1$ |
| $y = -\frac{7}{4}x + 7$ | $7x + 4y = 28$ | $\frac{x}{4} + \frac{y}{7} = 1$ |

**9.** (a)

| $A(0, 1)$ | |
|---|---|
| $y$ | $2x + 1$ |
| 1 | 1 |

| $B(1, 3)$ | |
|---|---|
| $y$ | $2x + 1$ |
| 3 | 3 |

| $C(5, 5)$ | |
|---|---|
| $y$ | $2x + 1$ |
| 5 | 11 |

| $D(4, 1)$ | |
|---|---|
| $y$ | $2x + 1$ |
| 1 | 9 |

(b) Sekiranya nilai-nilai koordinat $x$ dan $y$ bagi suatu titik diganti ke dalam persamaan garis lurus, dan nilai sebelah kiri sama dengan nilai sebelah kanan, maka titik tersebut terletak pada garis lurus tersebut dan sebaliknya. Titik-titik pada garis lurus atau titik-titik yang dilalui oleh garis lurus akan memenuhi persamaan garis lurus.

*If the values of x and y coordinates of a point are substituted into the equation of a straight line, and the values of the left hand side equals to the right hand side, then the point lies on the straight line and vice versa. The points on the straight line or the points passed by the straight line will satisfy the equation of the straight line.*

**10.** (a) Sebelah kiri:
*Left hand side:*
$2x + y = 2(3) + (-7)$
$= -1$
Sebelah kanan:
*Right hand side:*
3
$-1 \neq 3$
Titik *P* tidak terletak pada garis lurus.
*Point P is not on the straight line.*

(b) Sebelah kiri:
*Left hand side:*
$3x - 4y = 3(8) - 4(6)$
$= 0$
Sebelah kanan:
*Right hand side:*
$-4$
$0 \neq -4$
Titik *P* tidak terletak pada garis lurus.
*Point P is not on the straight line.*

(c) Sebelah kiri:
*Left hand side:*
$\frac{x}{4} + \frac{y}{8} = \frac{-0.5}{4} + \frac{9}{8}$
$= 1$
Sebelah kanan:
*Right hand side:*
1
$1 = 1$
Titik *P* terletak pada garis lurus.
*Point P is on the straight line.*

(d) Sebelah kiri:
*Left hand side:*
$-\frac{x}{2} + \frac{y}{3} = -\frac{2}{2} + \frac{5}{3}$
$= \frac{2}{3}$
Sebelah kanan:
*Right hand side:*
1
$\frac{2}{3} \neq 1$
Titik *P* tidak terletak pada garis lurus.
*Point P is not on the straight line.*

(e) Sebelah kiri:
*Left hand side:*
$y = 3$
Sebelah kanan:
*Right hand side:*
$5 - 4x = 5 - 4(\frac{1}{2})$
$= 3$
$3 = 3$
Titik *P* terletak pada garis lurus.
*Point P is on the straight line.*

**11.** (a) $y = 5x + 1$
$k = 5(4) + 1$
$= 20 + 1$
$= 21$

(b) $y = -3x - k$
(0, –5) ialah pintasan-$y$.
*is a y-intercept.*
Maka, / *Hence*,
$k = 5$

(c) $2y = 3x + 1$
$2(5) = 3k + 1$
$10 = 3k + 1$
$3k = 9$
$k = 3$

(d) $y = kx + 7$
$3 = k(1) + 7$
$k = 3 - 7$
$= -4$

(e) $y = -2x + k$
$-\frac{3}{2} = -2(1) + k$
$k = \frac{1}{2}$

(f) $y = kx - 3$
$7 = k(-2) - 3$
$-2k = 10$
$k = -5$

(g) (i) $m$ ialah pintasan-$y$
*m is y-intercept*
$3(0) + 2m = 6$
$2m = 6$
$m = 3$

(ii) $n$ ialah pintasan-$x$
*n is x-intercept*

$3n + 2(0) = 6$
$3n = 6$
$n = 2$

(iii) $3(3) + 2k = 6$
$9 + 2k = 6$
$2k = -3$
$k = -\frac{3}{2}$

(iv) Kecerunan/ *Gradient*
$= -\frac{\text{pintasan-}y}{\text{pintasan-}x} / -\frac{\textit{y-intercept}}{\textit{x-intercept}}$
$= -\frac{3}{2}$

**12.** (a)

| | $y = x + 2$ | $y = x$ | $y = \frac{3}{2}x - 3$ |
|---|---|---|---|
| **Kecerunan/ *Gradient*** | 1 | 1 | $\frac{3}{2}$ |

(b) Sekiranya kecerunan kedua-dua garis lurus adalah sama, maka garis-garis lurus tersebut adalah _____selari_____.

*If the gradients of both straight lines are equal, then the straight lines are* _____*parallel*_____.

**13.** (a) $m_{PQ} = \frac{9-3}{6-1}$ $m_{RS} = \frac{11-5}{12-7}$
$= \frac{6}{5}$ $= \frac{6}{5}$

$m_{PQ} = m_{RS}$

*PQ* selari dengan *RS*.
*PQ is parallel to RS.*

(b) $m_{PQ} = \frac{7-(-2)}{2-5}$ $m_{RS} = \frac{9-(-1)}{7-8}$
$= \frac{9}{-3}$ $= \frac{10}{-1}$
$= -3$ $= -10$

$m_{PQ} \neq m_{RS}$

*PQ* tidak selari dengan *RS*.
*PQ is not parallel to RS.*

(c) $m_{PQ} = \frac{9-5}{-3-(-1)}$ $m_{RS} = \frac{7-1}{2-5}$
$= \frac{4}{-2}$ $= \frac{6}{-3}$
$= -2$ $= -2$

$m_{PQ} = m_{RS}$

*PQ* selari dengan *RS*.
*PQ is parallel to RS.*

**14.** (a) $m_1 = \frac{3}{2}$ $y = \frac{3}{2}x - 1$
$m_2 = \frac{3}{2}$

Kecerunan adalah sama.
*Gradients are equal.*
∴ Selari / *Parallel*

(b) $m_1 = \frac{4}{5}$ $4y = -5x - 4$
$y = -\frac{5}{4}x - 1$
$m_2 = -\frac{5}{4}$

Kecerunan adalah tidak sama.
*Gradients are not equal.*
∴ Tidak selari / *Not parallel*

(c) $y = \frac{1}{3}x + 8$, $y = \frac{1}{3}x - 4$
$m_1 = \frac{1}{3}$ $m_2 = \frac{1}{3}$

Kecerunan adalah sama.
*Gradients are equal.*
∴ Selari / *Parallel*

(d) $-2x - 5y = 10$ $y = -\frac{3}{5}x + 2$
$-5y = 2x + 10$
$y = -\frac{2}{5}x - 2$
$m_1 = -\frac{2}{5}$ $m_2 = -\frac{3}{5}$

Kecerunan adalah tidak sama.
*Gradients are not equal.*
∴ Tidak selari / *Not parallel*

(e) $2y = 5x - 8$, $4x - 3y = 1$
$y = \frac{5}{2}x - 4$ $3y = 4x - 1$
$y = \frac{4}{3}x - \frac{1}{3}$
$m_1 = \frac{5}{2}$ $m_2 = \frac{4}{3}$

Kecerunan adalah tidak sama.
*Gradients are not equal.*
∴ Tidak selari / *Not parallel*

**15.** (a) $2y - 4x = 6, \quad kx - 3y = 7$

$2y = 4x + 6, \quad 3y = kx - 7$

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

Maka/ *Hence*, $2 = \frac{k}{3}$

$k = 6$

(b) $2y = kx + 4, \quad x - 2y = 2$

$y = \frac{k}{2}x + 2, \qquad 2y = x - 2$

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

Maka/ *Hence*, $\frac{k}{2} = \frac{1}{2}$

$k = 1$

(c) $3 - 2x + y = 0, \quad ky = 6x - 8$

$y = 2x - 3, \qquad y = \frac{6}{k}x - \frac{8}{k}$

Maka/ *Hence*, $2 = \frac{6}{k}$

$k = 3$

**16.** *OA*: $2y = hx$

$y = \frac{h}{2}x$

*CB*: $y = -\frac{3}{2}x + 16$

$m_{OA} = m_{CB}$

$\frac{h}{2} = -\frac{3}{2}$

$h = -3$

*AB*: $kx - 2y = 16$

$2y = kx - 16$

$y = \frac{k}{2}x - 8$

*OC*: $y = \frac{1}{2}x$

$m_{AB} = m_{OC}$

$\frac{k}{2} = \frac{1}{2}$

$k = 1$

**17.** (a) $y = 2x + 3$

(b) $y = 5$

(c) $x = 2$

(d) Kecerunan, $m = -\frac{3}{4}$
*Gradient, m*

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

**18.** (a) (1, 2); Kecerunan/ *Gradient* = 3

$y = mx + c$

$2 = 3(1) + c$

$c = 2 - 3$

$= -1$

Persamaan/ *Equation*: $y = 3x - 1$

(b) (–2, 3); Kecerunan/ *Gradient* = 5

$y = mx + c$

$3 = 5(-2) + c$

$c = 3 + 10$

$= 13$

Persamaan/ *Equation*: $y = 5x + 13$

(c) (–1, –3); Kecerunan/ *Gradient* = 3

$y = mx + c$

$-3 = 3(-1) + c$

$c = -3 + 3$

$= 0$

Persamaan/ *Equation*: $y = 3x$

(d) (4, –4); Kecerunan/ *Gradient* = –2

$y = mx + c$

$-4 = -2(4) + c$

$c = -4 + 8$

$= 4$

Persamaan/ *Equation*: $y = -2x + 4$

(e) $\left(2, \frac{1}{2}\right)$; Kecerunan/ *Gradient* = 2

$y = mx + c$

$\frac{1}{2} = 2(2) + c$

$c = \frac{1}{2} - 4$

$= -\frac{7}{2}$

Persamaan/ *Equation*: $y = 2x - \frac{7}{2}$

(f) (3, –4); Kecerunan/ *Gradient* = $\frac{3}{4}$

$y = mx + c$

$-4 = \frac{3}{4}(3) + c$

$c = -4 - \frac{9}{4}$

$= -\frac{25}{4}$

Persamaan/ *Equation*: $y = \frac{3}{4}x - \frac{25}{4}$

**19.** (a) (3, –5); Pintasan-*y*/ *y-intercept* = –1

$y = mx + c$

$-5 = m(3) - 1$

$3m = -5 + 1$

$3m = -4$

$m = -\frac{4}{3}$

Persamaan/ *Equation*: $y = -\frac{4}{3}x - 1$

(b) (1, –8); Pintasan-*y*/ *y-intercept* = $\frac{1}{3}$

$y = mx + c$

$-8 = m(1) + \frac{1}{3}$

$m = -8 - \frac{1}{3}$

$m = -\frac{25}{3}$

Persamaan/ *Equation*: $y = -\frac{25}{3}x + \frac{1}{3}$

(c) (–7, –2); Pintasan-*y*/ *y-intercept* = 3

$y = mx + c$
$-2 = m(-7) + 3$
$-7m = -2 - 3$
$-7m = -5$
$m = \frac{5}{7}$

Persamaan/ *Equation*: $y = \frac{5}{7}x + 3$

(d) $\left(\frac{5}{2}, \frac{5}{4}\right)$; Pintasan-*y*/ *y-intercept* = $-\frac{25}{4}$

$y = mx + c$
$\frac{5}{4} = m\left(\frac{5}{2}\right) - \frac{25}{4}$
$\frac{5}{2}m = \frac{5}{4} + \frac{25}{4}$
$\frac{5}{2}m = \frac{15}{2}$
$m = 3$

Persamaan/ *Equation*: $y = 3x - \frac{25}{4}$

**20.** (a) (2, –1); (5, 0)

$m = \frac{-1 - 0}{2 - 5}$
$= \frac{-1}{-3}$
$= \frac{1}{3}$

$y = \frac{1}{3}x + c$
Pada / *At* (5, 0)
$0 = \frac{1}{3}(5) + c$
$c = -\frac{5}{3}$
Persamaan/ *Equation*:
$y = \frac{1}{3}x - \frac{5}{3}$

(b) (1, –7); (0, 3)

$m = \frac{-7 - 3}{1 - 0}$
$= -10$

$y = -10x + c$
Pada / *At* (0, 3)
$3 = -10(0) + c$
$c = 3$

Persamaan/ *Equation*:
$y = -10x + 3$

(c) (8, –3); (6, 6)

$m = \frac{6 - (-3)}{6 - 8}$
$= -\frac{9}{2}$

$y = -\frac{9}{2}x + c$
Pada / *At* (6, 6)
$6 = -\frac{9}{2}(6) + c$
$c = 6 + 27$
$= 33$

Persamaan/ *Equation*:
$y = -\frac{9}{2}x + 33$

(d) (–2, –5); (1, 4)

$m = \frac{4 - (-5)}{1 - (-2)}$
$= \frac{9}{3}$
$= 3$

$y = 3x + c$
Pada / *At* (1, 4)
$4 = 3(1) + c$
$c = 4 - 3$
$= 1$

Persamaan/ *Equation*:
$y = 3x + 1$

(e) (–6, 7); (–4, 9)

$m = \frac{9 - 7}{-4 - (-6)}$
$= \frac{2}{2}$
$= 1$

$y = x + c$
Pada / *At* (–6, 7)
$7 = -6 + c$
$c = 7 + 6$
$= 13$

Persamaan/ *Equation*:
$y = x + 13$

**21.**

| | Persamaan garis lurus *Equation of straight line* | | |
|---|---|---|---|
| (a) | $\frac{x}{2}+\frac{y}{3}=1$ | atau/*or* | $y=-\frac{3}{2}x+3$ |
| (b) | $-\frac{x}{3}+\frac{y}{5}=1$ | atau/*or* | $y=\frac{5}{3}x+5$ |
| (c) | $\frac{x}{6}-\frac{y}{4}=1$ | atau/*or* | $y=\frac{2}{3}x-4$ |

**22.** (a) $P(2, 7)$; $5x-2y=3$

$5x-2y=3$

$2y=5x-3$

$y=\frac{5}{2}x-\frac{3}{2}$

$\therefore\ m=\frac{5}{2}$

$y=\frac{5}{2}x+c$

Pada/ *At* $(2, 7)$

$7=\frac{5}{2}(2)+c$

$c=2$

$\therefore\ y=\frac{5}{2}x+2$

(b) $P(-12, 8)$; $\frac{5}{17}x+\frac{4}{17}y=1$

$\frac{5}{17}x+\frac{4}{17}y=1$

$5x+4y=17$

$4y=-5x+17$

$y=-\frac{5}{4}x+\frac{17}{4}$

$\therefore\ m=-\frac{5}{4}$

$y=-\frac{5}{4}x+c$

Pada/ *At* $(-12, 8)$

$8=-\frac{5}{4}(-12)+c$

$c=-7$

$\therefore\ y=-\frac{5}{4}x-7$

**23.** (a) $m=\frac{6-(-2)}{0-4}$

$=\frac{8}{-4}$

$=-2$

$y=-2x+c$

Pada/ *At* $(0, 6)$,

$6=-2(0)+c$

$c=6$

$y=-2x+6$

(b) $m=\frac{-2-1}{5-11}$

$=\frac{-3}{-6}$

$=\frac{1}{2}$

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

Pada/ *At* $(11, 1)$,

$1=\frac{1}{2}(11)+c$

$c=1-\frac{11}{2}$

$=-\frac{9}{2}$

$y=\frac{1}{2}x-\frac{9}{2}$

(c) $y=3$

(d) $x=\frac{3}{2}$

(e) $\frac{x}{8}+\frac{y}{5}=1$ atau/*or* $y=-\frac{5}{8}x+5$

(f) $\frac{x}{3}-\frac{y}{2}=1$ atau/*or* $y=\frac{2}{3}x-2$

(g) $m=2$

$y=2x+c$

Pada/ *At* $(1, 4)$,

$4=2(1)+c$

$c=4-2$

$=2$

$y=2x+2$

(h) $m=\frac{2}{3}$

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

Pada/ *At* $(2, 1)$,

$1=\frac{2}{3}(2)+c$

$c=1-\frac{4}{3}$

$=-\frac{1}{3}$

$y=\frac{2}{3}x-\frac{1}{3}$

(i) $m_M=\frac{8-6}{0-4}$

$=\frac{2}{-4}$

$=-\frac{1}{2}$

$m_N=-\frac{1}{2}$

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

Pada/ *At* $(0, 1)$,

$1=-\frac{1}{2}(0)+c$

$c=1$

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

(j) $3x+y=2$

$y=-3x+2$

$m_B=-3$

$m_A=-3$

$y=-3x+c$

Pada/ *At* $(0, 8)$,

$8=-3(0)+c$

$c=8$

$y=-3x+8$

(k) $m_C=-\frac{4}{1}$

$=-4$

$m_D=-4$

$y=-4x+c$

Pada/ *At* $(2, 0)$,

$0=-4(2)+c$

$c=8$

$y=-4x+8$

(l) $m_{PQ} = \frac{8-(-1)}{4-(-2)}$

$= \frac{9}{6}$

$= \frac{3}{2}$

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

Pada/ *At* (6, 6),

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

$c = 6 - 9$

$= -3$

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

(m) $y = \frac{2}{3}x + 3$

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

(i) $y = \frac{2}{3}x + c$

$1 = \frac{2}{3}(2) + c$

$c = -\frac{1}{3}$

$y = \frac{2}{3}x - \frac{1}{3}$

(ii) $y = \frac{2}{3}x + c$

$7 = \frac{2}{3}(3) + c$

$c = 5$

$y = \frac{2}{3}x + 5$

(iii) $y = \frac{2}{3}x + c$

$0 = \frac{2}{3}(0) + c$

$c = 0$

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

**24.** (a) $4x - y = -1$

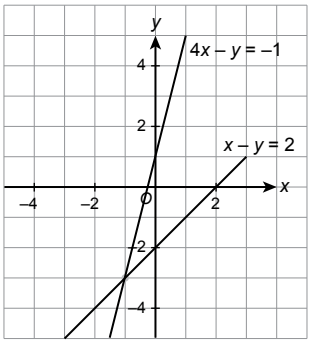
$y = 4x + 1$

| ***x*** | 0 | 1 |
|---|---|---|
| ***y*** | 1 | 5 |

$x - y = 2$

$y = x - 2$

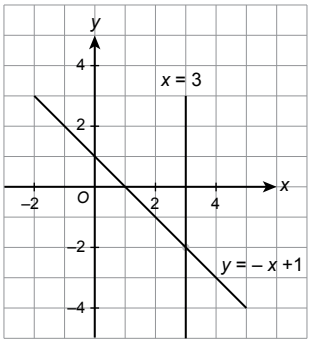
| ***x*** | 0 | 1 |
|---|---|---|
| ***y*** | −2 | −1 |




Titik persilangan = (−1, −3)
*Point of intersection*

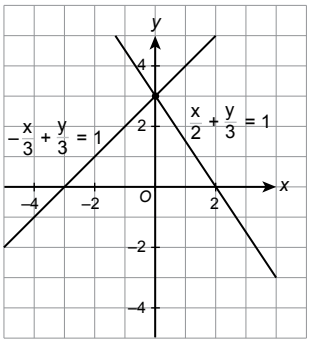
(b) $y = -x + 1$

| ***x*** | 0 | 1 |
|---|---|---|
| ***y*** | 1 | 0 |




Titik persilangan = (3, −2)
*Point of intersection*

(c)




Titik persilangan = (0, 3)
*Point of intersection*

(d) $2x + y = 4,\ y - x = 1$

$2x + y = 4$

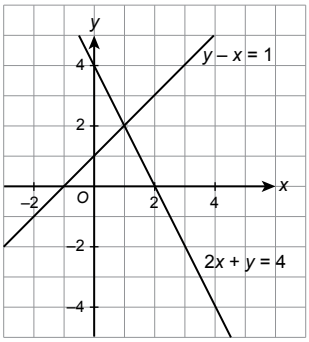
$y = -2x + 4$

| $x$ | 0 | 1 |
|---|---|---|
| $y$ | 4 | 2 |

$y - x = 1$

$y = x + 1$

| $x$ | 0 | 3 |
|---|---|---|
| $y$ | 1 | 4 |




Titik persilangan = (1, 2)
*Point of intersection*

(e) $x - 6 + 2y = 0,\ 3x = 2y + 2$

$x - 6 + 2y = 0$

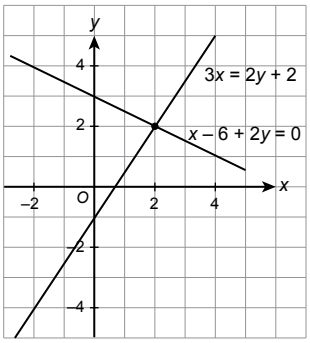
$y = -\frac{1}{2}x + 3$

| $x$ | 0 | 2 |
|---|---|---|
| $y$ | 3 | 2 |

$3x = 2y + 2$

$y = \frac{3}{2}x - 1$

| $x$ | 0 | 2 |
|---|---|---|
| $y$ | −1 | 2 |




Titik persilangan = (2, 2)
*Point of intersection*

**25.** (a) $x - 5y + 17 = 0$ ..... ①
$2x + y = -1$ ..... ②

Daripada/ *From* ①,
$x = 5y - 17$ ..... ③

Gantikan ③ ke dalam ②,
*Substitute* ③ *into* ②,
$2(5y - 17) + y = -1$
$10y - 34 + y = -1$
$11y = 33$
$y = 3$

Gantikan $y = 3$ ke dalam ③,
*Substitute* $y = 3$ *into* ③,
$x = 5(3) - 17$
$= 15 - 17$
$= -2$

Titik persilangan = (−2, 3)
*Point of intersection*

(b) $5x - 3y - 8 = 0$ ..... ①
$-3y = -2x + 5$ ..... ②

Daripada/ *From* ②,
$y = \frac{2}{3}x - \frac{5}{3}$ ..... ③

Gantikan ③ ke dalam ①,
*Substitute* ③ *into* ①,
$5x - 3(\frac{2}{3}x - \frac{5}{3}) - 8 = 0$
$5x - 2x + 5 - 8 = 0$
$3x = 3$
$x = 1$

Gantikan $x = 1$ ke dalam ③,
*Substitute* $x = 1$ *into* ③,
$y = \frac{2}{3}(1) - \frac{5}{3}$
$= -\frac{3}{3}$
$= -1$

Titik persilangan = (1, −1)
*Point of intersection*

(c) $4x - 7y = 0$ ..... ①
$8x - y - 26 = 0$ ..... ②

Daripada/ *From* ②,
$y = 8x - 26$ ..... ③

Gantikan ③ ke dalam ①,
*Substitute* ③ *into* ①,
$4x - 7(8x - 26) = 0$
$4x - 56x + 182 = 0$
$52x = 182$
$x = \frac{7}{2}$

Gantikan $x = \frac{7}{2}$ ke dalam ③,
*Substitute* $x = \frac{7}{2}$ *into* ③,
$y = 8(\frac{7}{2}) - 26$
$= 28 - 26$
$= 2$

Titik persilangan = $(\frac{7}{2}, 2)$
*Point of intersection*

(d) $\frac{x}{2} + \frac{5y}{6} = 1$ ..... ①
$5x - y = 10$ ..... ②

① × 6: $3x + 5y = 6$ ..... ③

Daripada/ *From* ②,
$y = 5x - 10$ ..... ④

Gantikan ④ ke dalam ③,
*Substitute* ④ *into* ③,
$3x + 5(5x - 10) = 6$
$3x + 25x - 50 = 6$
$28x = 56$
$x = 2$

Gantikan $x = 2$ ke dalam ④,
*Substitute* $x = 2$ *into* ④,
$y = 5(2) - 10$
$= 10 - 10$
$= 0$

Titik persilangan = (2, 0)
*Point of intersection*

(e) $y = -\frac{1}{3}x + \frac{7}{3}$ ..... ①
$y = x + 3$ ..... ②
① × 3: $3y = -x + 7$ ..... ③
Gantikan ② ke dalam ③,
*Substitute* ② *into* ③,
$3(x + 3) = -x + 7$
$3x + 9 = -x + 7$
$4x = -2$
$x = -\frac{1}{2}$

Gantikan $x = -\frac{1}{2}$ ke dalam ②,
*Substitute* $x = -\frac{1}{2}$ *into* ②,
$y = -\frac{1}{2} + 3$
$= \frac{5}{2}$

Titik persilangan = $(-\frac{1}{2}, \frac{5}{2})$
*Point of intersection*

**26.** (a) $7x - 4y = -7$ ..... ①
$5x + y = 22$ ..... ②
② × 4:
$20x + 4y = 88$ ..... ③

① + ③:
$27x = 81$
$x = 3$

Gantikan $x = 3$ ke dalam ①,
*Substitute* $x = 3$ *into* ①,
$7(3) - 4y = -7$
$4y = 21 + 7$
$4y = 28$
$y = 7$

Titik persilangan = (3, 7)
*Point of intersection*

(b) $x - 2y = 15$ ..... ①
$3y = -2x + 2$ ..... ②

① × 2:
$2x - 4y = 30$ ..... ③

Daripada/ *From* ②,
$2x + 3y = 2$ ..... ④

④ − ③:
$7y = -28$
$y = -4$

Gantikan $y = -4$ ke dalam ①,
*Substitute* $y = -4$ *into* ①,
$x - 2(-4) = 15$
$x + 8 = 15$
$x = 7$

Titik persilangan = (7, −4)
*Point of intersection*

(c) $x - 3y + 12 = 0$ ..... ①
$2x + 4y = -4$ ..... ②

① × 2:
$2x - 6y + 24 = 0$
$2x - 6y = -24$ ..... ③

② − ③:
$10y = 20$
$y = 2$

Gantikan $y = 2$ ke dalam ②,
*Substitute $y = 2$ into ②,*
$2x + 4(2) = -4$
$2x = -4 - 8$
$2x = -12$
$x = -6$

Titik persilangan = (−6, 2)
*Point of intersection*

(d) $y = \frac{1}{5}x - \frac{16}{5}$ ..... ①
$-3x + 7y = -8$ ..... ②

① × 5:
$5y = x - 16$
$x - 5y = 16$ ..... ③

③ × 3:
$3x - 15y = 48$ ..... ④

② + ④:
$-8y = 40$
$y = -5$

Gantikan $y = -5$ ke dalam ③,
*Substitute $y = -5$ into ③,*
$x - 5(-5) = 16$
$x + 25 = 16$
$x = -9$

Titik persilangan = (−9, −5)
*Point of intersection*

(e) $y = -\frac{1}{3}x + \frac{8}{3}$ ..... ①
$2x - 3y = 2$ ..... ②

① × 3:
$3y = -x + 8$
$x + 3y = 8$ ..... ③

③ + ②:
$3x = 10$
$x = \frac{10}{3}$

Gantikan $x = \frac{10}{3}$ ke dalam ②,
*Substitute $x = \frac{10}{3}$ into ②,*
$2\left(\frac{10}{3}\right) - 3y = 2$
$3y = \frac{20}{3} - 2$
$3y = \frac{14}{3}$
$y = \frac{14}{9}$

Titik persilangan = $\left(\frac{10}{3}, \frac{14}{9}\right)$
*Point of intersection*

**27.** (a) $5x + 7y - 35 = 0$
$5x + 7y = 35$
$\frac{5x}{35} + \frac{7y}{35} = \frac{35}{35}$
$\frac{x}{7} + \frac{y}{5} = 1$
pintasan-*x*/ *x-intercept* = 7,
pintasan-*y*/ *y-intercept* = 5
Luas kawasan *AOB* $= \frac{1}{2} \times 7 \times 5$
*The area of the region AOB* $= 17.5 \text{ unit}^2$

(b) (i) 25 cm

(ii) $x = 4, y = \frac{1}{2}(4) + 25$
$= 2 + 25$
$= 27$
Ketinggian selepas 4 minggu ialah 27 cm.
*The height after 4 weeks is 27 cm.*

(iii) $y = 45, \ \frac{1}{2}x + 25 = 45$
$\frac{1}{2}x = 20$
$x = 40$
Bilangan minggu yang diperlukan ialah 40 minggu.
*The number of weeks needed is 40 weeks.*

(c) (i) Katakan $y$ = kos bayaran dan $x$ = masa menyewa bot, maka
*Let y = cost and x = time of renting a boat, then*
Pilihan *A*/ *Option A*: $y = 4x + 10$
Pilihan *B*/ *Option B*: $y = 2x + 15$

(ii) $4x + 10 = 2x + 15$
$4x - 2x = 15 - 10$
$2x = 5$
$x = 2.5$
Pada 2.5 jam, kos bayaran kedua-dua pilihan itu adalah sama.
*At 2.5 hours, the two options cost the same amount.*

(iii) Pilihan *A*/ *Option A*:
$y = 4(2) + 10$
$= 8 + 10$
$= 18$
Pilihan *B*/ *Option B*:
$y = 2(2) + 15$
$= 4 + 15$
$= 19$
Pilihan *A* lebih baik jika Halim ingin menyewa 2 jam kerana lebih murah.
*Option A is better if Halim wants to rent for 2 hours because it is cheaper.*

(d) Jalan *A*/ *Road A*: $y = -x + 3$ ..... ①
Jalan *B*/ *Road B*: $2y = 3x + 1$ ..... ②
Gantikan ① ke dalam ②,
*Substitute ① into ②,*
$2(-x + 3) = 3x + 1$
$-2x + 6 = 3x + 1$
$-2x - 3x = 1 - 6$
$-5x = -5$
$x = 1$
Gantikan $x = 1$ ke dalam ①,
*Substitute x = 1 into ①,*
$y = -1 + 3$
$= 2$
Koordinat titik pada kolam air pancut = (1, 2)
*The coordinates of point at the fountain*

# Power PT3

## Bahagian A

**1.** $4y + x = 16$
$4y = -x + 16$
$y = -\frac{1}{4}x + 4$
Kecerunan/ *Gradient* $= -\frac{1}{4}$
Jawapan / *Answer*: **B**

**2.** $y = -2x + 4$
$2x + y = 4$
$\frac{2x}{4} + \frac{y}{4} = \frac{4}{4}$
$\frac{x}{2} + \frac{y}{4} = 1$
Jawapan / *Answer*: **A**

**3.** $2x - y = 6$
Pada/ *At* (0, –6),
sebelah kiri/ *left hand side*: $2(0) - (-6) = 6$
sebelah kanan/ *right hand side*: 6
Maka, (0, –6) terletak pada garis lurus $2x - y = 6$.
*Hence,* (0, –6) *is on the straight line* $2x - y = 6$.

Pada/ *At* (3, 0),
sebelah kiri/ *left hand side*: $2(3) - (0) = 6$
sebelah kanan/ *right hand side*: 6
Maka, (3, 0) terletak pada garis lurus $2x - y = 6$.
*Hence,* (3, 0) *is on the straight line* $2x - y = 6$.
Jawapan / *Answer*: **D**

**4.** $-\frac{x}{3} + \frac{y}{5} = 1$
$-5x + 3y = 15$
$3y = 5x + 15$
$y = \frac{5}{3}x + 5$
Jawapan / *Answer*: **C**

**5.** Persamaan garis lurus *A*: $y = -2x + 7$
*Equation of straight line A*
Kecerunan/ *Gradient* $= -2$

**A** $2x + 2y = 6$
$2y = -2x + 6$
$y = -x + 3$ (Kecerunan/ *Gradient* $= -1$)

**B** $x - y = 3$
$y = x - 3$ (Kecerunan/ *Gradient* $= 1$)

**C** $-x + 2y = 2$
$2y = x + 2$
$y = \frac{1}{2}x + 1$ (Kecerunan/ *Gradient* $= \frac{1}{2}$)

**D** $-4x - 2y = 6$
$2y = -4x - 6$
$y = -2x - 3$ (Kecerunan/ *Gradient* $= -2$)

Persamaan yang mungkin bagi garis lurus *B* ialah
*The possible equation of the straight line B is*
$-4x - 2y = 6$
Jawapan / *Answer*: **D**

**6.** A $y + x + 1 = 0$
$y = -x - 1$ (pintasan-$y$/ *y-intercept* $= -1$)

**B** $2y = x + 1$
$y = \frac{1}{2}x + \frac{1}{2}$ ((pintasan-$y$/ *y-intercept* $= \frac{1}{2}$)

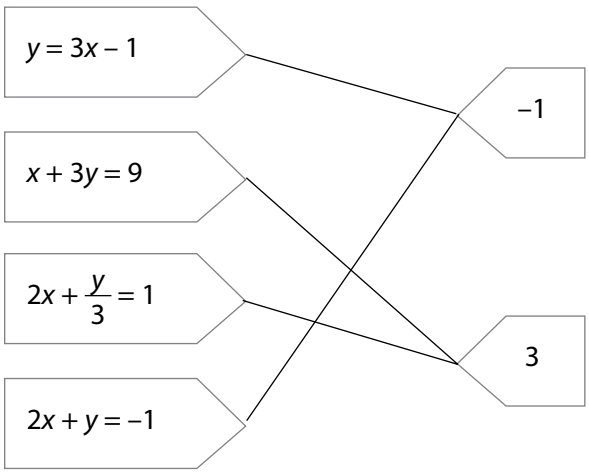
**C** $x - y = 5$
$y = x - 5$ (pintasan-$y$/ *y-intercept* $= -5$)

**D** $3y + x - 3 = 0$
$3y = -x + 3$
$y = -\frac{1}{3} + 1$ (pintasan-$y$/ *y-intercept* $= 1$)

Jawapan / *Answer*: **D**

## Bahagian B

**7.**




**8.**

| **Persamaan garis lurus** *Equation of straight line* | **Kecerunan** *Gradient* |
|---|---|
| $2y = x - 1$ | $\frac{1}{2}$ |
| $-\frac{x}{5} + \frac{y}{4} = 1$ | $\frac{4}{5}$ |
| $2x + 1 = y$ | 2 |
| $14x + 7y = 21$ | −2 |

## Bahagian C

**9.** (a) (i) Daripada $y = 2x + 3$, kecerunan = 2
*From* $y = 2x + 3$, *gradient* = 2

(ii) Kecerunan garis lurus I
*Gradient of straight line I*
$= -\frac{1}{2}$

Garis lurus I dan II tidak selari. Kecerunan kedua-dua garis lurus itu tidak sama, $2 \neq -\frac{1}{2}$.
*Straight lines I and II are not parallel. The gradients of both the straight lines are not equal,* $2 \neq -\frac{1}{2}$.

(b) (i) $m_{SR} = m_{PQ} = \frac{7 - 5}{1 - 9}$
$= \frac{2}{-8}$
$= -\frac{1}{4}$

$y = -\frac{1}{4}x + c$

Pada/ *At* $(-7, -1)$,

$-1 = -\frac{1}{4}(-7) + c$

$c = -1 - \frac{7}{4}$
$= -\frac{11}{4}$

Persamaan *SR*/ *Equation of SR*:
$y = -\frac{1}{4}x - \frac{11}{4}$

(ii) $R$ ialah titik persilangan $SR$ dan $QR$.
*R is an intersection point of SR and QR.*

Persamaan *QR*/ *Equation of QR*:

$x = 9$ ← *QR* selari dengan garis mencancang *TU*, $x = 6$
*QR is parallel to vertical line TU,* $x = 6$

Gantikan $x = 9$ ke dalam $y = -\frac{1}{4}x - \frac{11}{4}$,
*Substitute* $x = 9$ *into* $y = -\frac{1}{4}x - \frac{11}{4}$,

$y = -\frac{1}{4}(9) - \frac{11}{4}$
$= -\frac{9}{4} - \frac{11}{4}$
$= -5$

Koordinat titik $R = (9, -5)$
*Coordinates of point R*

(c) (i) 40%

(ii) $c = 40$
$y = mx + 40$
Titik (20, 80) daripada graf,
*Point* (20, 80) *from the graph,*
$80 = m(20) + 40$
$20m = 40$
$m = 2$

Persamaan garis lurus itu ialah
*The equation of the straight line is*
$y = 2x + 40$.

**10.** (a) (i) Sebelah kiri: *Left hand side:* $y = 7$

Sebelah kanan: *Right hand side:* $-5x + 2 = -5(-1) + 2 = 7$

$7 = 7$

$\therefore$ Titik $Q$ terletak pada garis lurus.
*Point Q is on the straight line.*

(ii) $y = mx + c$

$y = \frac{5 - 1}{-2 - 0}x + 1$

$y = -2x + 1$

(b) $2y = -x + 2$

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

Kecerunan garis yang melalui $A = -\frac{1}{2}$
*Gradient of line through A*

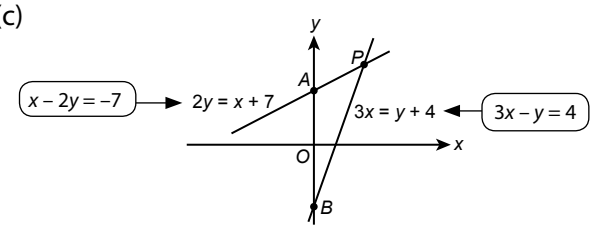
$y = -\frac{1}{2}x + c$

Pada/ *At* $A(2, 5)$, $5 = -\frac{1}{2}(2) + c$

$c = 6$

Persamaan/ *Equation* : $y = -\frac{1}{2}x + 6$

(c)




$3x - y = 4$ ..... ①

$x - 2y = -7$ ..... ②

② × 3, $3x - 6y = -21$ ..... ③

① – ③, $5y = 25$

$y = 5$

Gantikan $y = 5$ ke dalam ①,
*Substitute* $y = 5$ *into* ①,

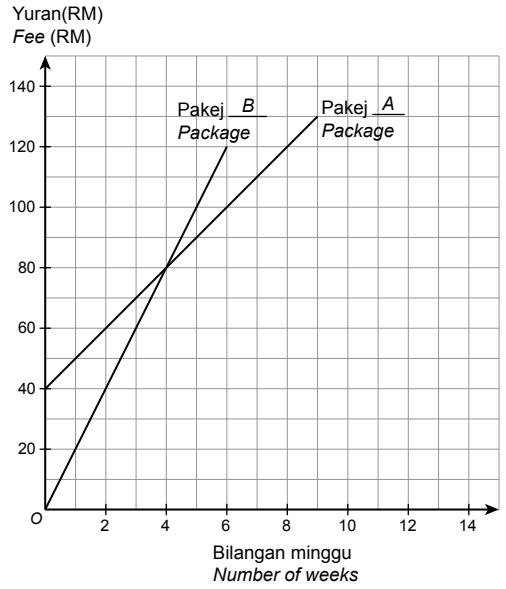
$3x - 5 = 4$

$x = 3$

$\therefore$ Titik persilangan ialah $P(3, 5)$.
*The point of intersection is* $P(3, 5)$.

# Power KBAT

**1.** (a)




(b) Minggu ke-4, iaitu RM80.
4th *week, that is* RM80.

(c) Yuran pakej $A$/ *Fee of package A* $= 40 + 10(10)$
$= 40 + 100$
$=$ RM140

Yuran pakej $B$/ *Fee of package B* $= 20(10)$
$=$ RM200

Beza bayaran/ *Difference of payment*
$= 200 - 140$
$=$ RM60