

Penyelesaian Lengkap

Praktis 1

Praktis Formatif

1.1 Ubahan Langsung Direct Variation

- 1 (a) Ya/Yes
 (b) Berkurang sebanyak 40%
Decreases by 40%
 (c) Ya, ini adalah ubahan langsung, $y \propto x$.
Yes, it is a direct variation, $y \propto x$.
 (d) Graf y melawan x ialah satu garis lurus melalui asalan.
Graph of y against x is a straight line passes through the origin.
- (e) $\frac{y}{x}$
- 2 (a) Jisim menjadi separuh
The mass becomes halved
 (b) Jisim menjadi satu pertiga daripada asal
The mass becomes one third of the original
- 3 (a) (i) 1 km = 1 000 m
 20 km \rightarrow 1 jam/hour
 5 km \rightarrow $\frac{60 \text{ minit/minutes}}{4}$
 \rightarrow 15 minit/minutes
 (ii) 20 km \rightarrow 1 jam/hour
 20 000 m \rightarrow 60 minit/minutes
 2 000 m \rightarrow 6 minit/minutes
- (b) (i) 1 jam/hour \rightarrow 20 km
 60 minit/minutes \rightarrow 20 km
 30 minit/minutes \rightarrow 10 km
 \rightarrow 10 000 m
 (ii) 1 jam/hour \rightarrow 20 km
 3 600 saat/seconds \rightarrow 20 000 m
 900 saat/seconds \rightarrow $\frac{20\,000}{4}$ m
 \rightarrow 5 000 m
- (c) Jarak yang dilalui berubah secara langsung dengan masa yang diambil. $j \propto t$
The distance travelled varies directly as the time taken. $j \propto t$

$$4 \quad f \propto \sqrt[3]{g}$$

$$f = k\sqrt[3]{g}$$

$$k = \frac{f}{\sqrt[3]{g}}$$

f	1	2	$1(\sqrt[3]{125})$ = 5	8	$1(\sqrt[3]{8\,000})$ = 20
g	1	$\left(\frac{2}{1}\right)^3 = 8$	125	$\left(\frac{8}{1}\right)^3$ = 512	8 000
$\frac{f}{\sqrt[3]{g}}$	1	1	1	1	1

- 5 (a) (i) $p \propto q$
 $k = \frac{p}{q}$
 $= \frac{0.12}{3}$
 $= \frac{1}{25}$
 $\therefore p = \frac{q}{25}$
- (ii) $p = \frac{10}{25}$
 $= \frac{2}{5}$
- (b) (i) $q \propto p^2$
 $k = \frac{q}{p^2}$
 $= \frac{3}{0.12^2}$
 $= \frac{625}{3}$
 $\therefore q = \frac{625p^2}{3}$
- (ii) $q = \frac{625(3)^2}{3}$
 $= 1\,875$
- (iii) $\frac{625}{3}$
- 6 (a) $p \propto qr^3$
 (b) $x \propto y^3z^2$
 (c) $g \propto mqn^{\frac{1}{2}}$
- 7 (a) $p \propto qr$
 $p = kqr$
 $10 = k(4)(3)$
 $k = \frac{10}{12}$

$$k = \frac{5}{6}$$

$$\therefore p = \frac{5}{6}qr$$

$$(b) y \propto x^2\sqrt{z}$$

$$y = kx^2\sqrt{z}$$

$$20 = k(2^2)(\sqrt{25})$$

$$20 = k(4)(5)$$

$$k = 1$$

$$\therefore y = x^2\sqrt{z}$$

$$8 \quad A \propto B^3\sqrt{C}$$

$$A = kB^3\sqrt{C}$$

$$0.2 = k(4)(\sqrt[3]{1})$$

$$k = \frac{0.2}{4(1)}$$

$$= 0.05$$

$$\therefore A = 0.05B^3\sqrt{C}$$

$$p = 0.05(10)^3\sqrt{8}$$

$$= 1$$

$$0.9 = 0.05(36)^3\sqrt{q}$$

$$\sqrt[3]{q} = 0.5$$

$$q = 0.125$$

9 (a) (i)

Isi padu Volume (cm ³)	4 × 4 × 4 = 64	9 × 9 × 9 = 729	11 × 11 × 11 = 1 331
Harga/Price (RM)	6.40	72.90	133.10
Harga bagi 1 cm ³ keju (RM) The price of 1 cm ³ of cheese (RM)	0.1	0.1	0.1

Ya, harga keju, m berubah secara langsung dengan isi padu keju, v . Harga bagi 1 cm³ keju ialah pemalar bagi ketiga-tiga keju tersebut, iaitu RM0.10.

Yes, the price of cheese, m varies directly as the volume of cheese, v . The price of 1 cm³ of cheese is a constant for the three cheese, that is RM0.10.

$$(ii) m = 0.1v$$

$$(b) \text{ Harga/Price} = 0.1 \times 7 \times 7 \times 7 \\ = \text{RM}34.30$$

1.2 Ubahan Songsang Inverse Variation

$$1 \quad (a) \quad (i) \quad \frac{\text{RM}5\,000}{500} = \text{RM}10$$

$$(ii) \quad \frac{\text{RM}5\,000}{100} = \text{RM}50$$

(b) Amaun yang diderma oleh setiap penderma berubah secara songsang dengan bilangan

$$\text{penderma. } m \propto \frac{1}{n}$$

The amount of donation per donor changes inversely as the number of donors. $m \propto \frac{1}{n}$

2 (a)

y	60	30	20	15	12
x	1	8	27	64	125
$\frac{1}{x^3}$	1	2	3	4	5
$\frac{1}{x^3}y$	60	60	60	60	60
$\frac{1}{x^3}$	1	0.5	0.33	0.25	0.2

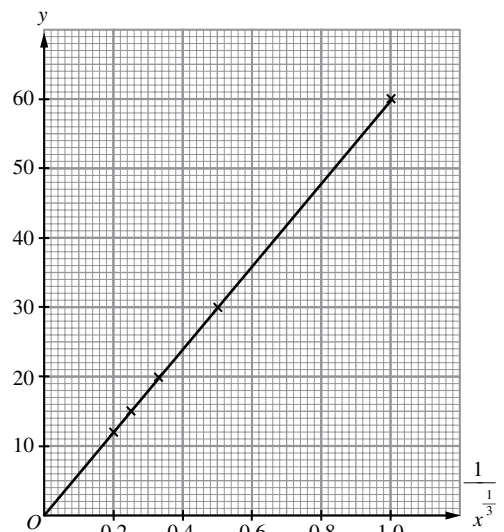
Oleh sebab nilai $\frac{1}{x^3}y = 60$ (pemalar yang sama),

maka y berubah secara songsang dengan x^3 .

Because the value of $\frac{1}{x^3}y = 60$ (same constant), then

y varies inversely as x^3 .

(b)



(c) Kecerunan graf mewakili pemalar ubahan.

Gradient of graph represents the constant of variation.

$$(d) y = \frac{60}{\frac{1}{x^3}} \text{ atau } x^3 y = 60$$

$$3 \quad (a) \quad \frac{1}{2}$$

$$(b) \quad 3$$

$$4 \quad p \propto \frac{1}{q^2} \Rightarrow p = k\left(\frac{1}{q^2}\right)$$

Apabila/When $p = 30, q = 3$

$$30 = k\left(\frac{1}{3^2}\right)$$

$$k = 270$$

Maka/Therefore,

$$p = 270\left(\frac{1}{q^2}\right).$$

Apabila/When $p = 7\frac{1}{2}$,

Kaedah Alternatif:
Alternative method:

$$q_1^2 p_1 = q_2^2 p_2$$

$$3^2 \times 30 = q_2^2 \left(\frac{15}{2}\right)$$

$$270 \times \frac{2}{15} = q_2^2$$

$$q_2^2 = 36$$

$$q_2 = \pm 6$$

$$7\frac{1}{2} = 270\left(\frac{1}{q^2}\right)$$

$$q^2 = 270 \times \frac{2}{15}$$

$$q^2 = 36$$

$$q = \pm 6$$

$$5 \quad t \propto \frac{1}{j^2}$$

$$t = k\left(\frac{1}{j^2}\right)$$

Apabila/When $t = 9, j = 4$.

$$9 = k\left(\frac{1}{4^2}\right)$$

$$k = 144$$

$$\therefore t = 144\left(\frac{1}{j^2}\right)$$

Kaedah Alternatif:
Alternative method:

$$(a) \quad j_1^2 t_1 = j_2^2 t_2$$

$$3^2 \times t_1 = 4^2(9)$$

$$t_1 = \frac{4^2(9)}{3^2}$$

$$t_1 = 16$$

$$(b) \quad j_1^2(4) = 4^2(9)$$

$$j_1^2 = \frac{4^2(9)}{4}$$

$$j_1^2 = 36$$

$$j_1 = 6$$

(a) Apabila/When $j = 3$,

$$t = 144\left(\frac{1}{3^2}\right)$$

$$t = 16$$

(b) Apabila/When $t = 4$,

$$4 = 144\left(\frac{1}{j^2}\right)$$

$$j^2 = 144 \times \frac{1}{4}$$

$$j^2 = 36$$

$$j = 6$$

6 Ubahan songsang, iaitu h berubah secara songsang dengan r^2 .

Inverse variation, that is h varies inversely as r^2 .

$$r_1^2 h_1 = r_2^2 h_2$$

$$(3)^2 8 = (2)^2 h_2$$

$$h_2 = 18$$

1.3 Ubahan Bergabung Combined Variation

1 (a) $y \propto \frac{x^2}{z}$

$$y = k\left(\frac{x^2}{z}\right)$$

Apabila/When $x = 3, y = 36$ dan/and $z = 4$.

$$36 = k\left(\frac{3^2}{4}\right)$$

$$k = 16$$

Maka/Therefore, $y = 16\left(\frac{x^2}{z}\right)$

(b) Apabila/When $y = 144$ dan/and $z = 4$,

$$144 = 16\left(\frac{x^2}{4}\right)$$

$$x^2 = 36$$

$$x = \pm 6$$

2 $p \propto \frac{\sqrt{s}}{qr^2}$

$$1 = k \frac{\sqrt{144}}{3(2)^2}$$

$$k = 1$$

$$m = \frac{\sqrt{196}}{2(3)^2}$$

$$m = \frac{14}{18}$$

$$m = \frac{7}{9}$$

Praktis Sumatif

Kertas 1

- 1 C 2 C 3 B 4 C 5 A
6 D

Kertas 2

Bahagian/Section A

1

x	3	5	7	9	11
y	12	20	28	36	44
$\frac{y}{x}$	4	4	4	4	4

Ya. Semua nilai $\frac{y}{x} = 4$ (pemalar yang seragam), maka y berubah secara langsung dengan x .

Yes. Because all the values of $\frac{y}{x} = 4$ (uniform constant), thus y varies directly as x .

2

p	4	25	$y = 49$
q	12	$x = 30$	42

$$\frac{12}{\sqrt{4}} = \frac{x}{\sqrt{25}}$$

$$x = 30$$

$$\frac{12}{\sqrt{4}} = \frac{42}{\sqrt{y}}$$

$$y = 49$$

3 (a) $z = kxy$

$$18 = k(2)(3)$$

$$k = 3$$

$$z = 3xy$$

(b) $m = 3(4)(6)$

$$m = 72$$

$$4 \text{ (a) } p = km^2n^3\sqrt{r}$$

$$36 = k(3)^2(2)^3\sqrt{9}$$

$$36 = 216k$$

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

$$p = \frac{1}{6}m^2n^3\sqrt{r}$$

$$(b) \quad p = 360, n = 3 \text{ dan/and } r = 25.$$

$$360 = \frac{1}{6}m^2(3)^3\sqrt{25}$$

$$m^2 = 16$$

$$m = \pm 4$$

$$5 \quad c \propto \frac{a}{b^2}$$

$$c = \frac{ka}{b^2}$$

$$15 = \frac{k(3)}{2^2}$$

$$k = 20$$

Apabila/When $a = 5$ dan/and $b = 1$,

$$c = \frac{20a}{b^2}$$

$$x = \frac{20(5)}{1^2}$$

$$x = 100$$

Apabila/When $a = 8$, $b = y$ dan/and $c = 25$,

$$c = \frac{20a}{b^2}$$

$$25 = \frac{20(8)}{y^2}$$

$$y^2 = 6.4$$

$$y = \pm 2.530$$

$$6 \text{ (a) } H \propto N$$

$$H = kN$$

$$H = k(2j - 3)$$

Apabila/When $H = 0.15$ dan/and $j = 6$,

$$0.15 = k(2(6) - 3)$$

$$k = \frac{1}{60}$$

$$H = \frac{2j - 3}{60}$$

(b) Apabila/When $H = 4$,

$$H = \frac{2j - 3}{60}$$

$$4 = \frac{2j - 3}{60}$$

$$2j - 3 = 240$$

$$N = 240$$