

Jawapan

Praktis 5

Praktis Formatif

1 (a) $d = 11 - 4$
 $= 7$

(b) $T_{13} = 4 + (12)(7)$
 $= 88$

2 $T_n < 0$
 $63 + (n-1)(-4) < 0$
 $n > \frac{-63}{-4} + 1$
 $n > 16.75$
 $n = 17$

3 $T_7 = 2T_2$
 $a + 6d = 2(a + d)$
 $a + 6d = 2a + 2d$
 $a = 4d \dots \textcircled{1}$

$T_{11} = 21$
 $a + 10d = 21 \dots \textcircled{2}$

Gantikan $\textcircled{1}$ ke dalam $\textcircled{2}$ /Substitute $\textcircled{1}$ into $\textcircled{2}$,
 $14d = 21$

$d = \frac{3}{2}$ atau/ or 1.5

Gantikan ke dalam $\textcircled{1}$ /Substitute into $\textcircled{1}$,

$a = 4\left(\frac{3}{2}\right)$
 $= 6$

4 (a) $a = 306, T_n = 493$
 $306 + (n-1)(17) = 493$
 $n = 12$

(b) $S_{12} = \frac{12}{2}[306 + 493]$
 $= 4794$

5 (a) $2x - 1 - (x - 2) = 4x - 7 - (2x - 1)$
 $x + 1 = 2x - 6$
 $x = 7$

(b) $7 - 2, 2(7) - 1, 4(7) - 7$
 $5, 13, 21$
 $a = 5, d = 8$

$T_4 + \dots + T_{11}$
 $= S_{11} - S_3$
 $= \frac{11}{2}[2(5) + 10(8)] - (5 + 13 + 21)$
 $= 456$

6 (a) $S_2 = 5(2)^2 - 2$
 $= 18$

(b) $S_1 = 5(1)^2 - 1$
 $= 4$

$T_2 = 18 - 4$
 $= 14$
 $d = 14 - 4$
 $= 10$

7 $S_n > 900$

$\frac{n}{2}[2(18) + (n-1)(6)] > 900$

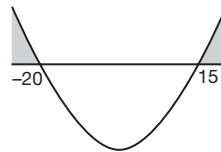
$n[18 + 3n - 3] > 900$

$3n^2 + 15n > 900$

$3n^2 + 15n - 900 > 0$

$\div 3, n^2 + 5n - 300 > 0$

$(n+20)(n-15) > 0$



$n > 0, n > 15$
 $\therefore n = 16$

8 $S_3 = 147$ atau/ or $T_1 + T_2 + T_3 = 147$

$\frac{3}{2}[2a + 2(4)] = 147$ atau/ or $a + (a+4) + (a+8)$

$3a + 12 = 147$

$a + 4 = 49$

$a = 45$

Tiga sebutan berturutan/Three consecutive terms
 $= 45, 49, 53$

9 (a) $T_4 = 9$

$a + 3d = 9 \dots \textcircled{1}$

$S_{10} - S_5 = 85$

$\frac{10}{2}[2a + 9d] - \frac{5}{2}[2a + 4d] = 85$

$10a + 45d - 5a - 10d = 85$

$5a + 35d = 85$

$a + 7d = 17 \dots \textcircled{2}$

$\textcircled{2} - \textcircled{1}, 4d = 8$

$d = 2$

(b) Gantikan ke dalam $\textcircled{1}$ /Substitute into $\textcircled{1}$,

$a + 3(2) = 9$

$a = 3$

10 (a) $S_{12} = 38\,400, d = 200$

$\frac{12}{2}[2a + 11(200)] = 38\,400$

$2a + 2\,200 = 6\,400$

$2a = 4\,200$

$a = 2\,100$

(b) $T_{12} = 2\,100 + 11(200)$

$= 4\,300$

$$11 \quad \frac{u}{3} = \frac{2v}{u}$$

$$v = \frac{u^2}{6}$$

$$12 \quad (a) \quad \frac{k}{k+4} = \frac{k-2}{k}$$

$$k^2 = k^2 + 2k - 8$$

$$k = 4$$

$$(b) \quad r = \frac{4}{4+4}$$

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

$$13 \quad (a) \quad ar^2 = 2 \dots \textcircled{1}$$

$$ar^5 = 54 \dots \textcircled{2}$$

$$\frac{\textcircled{2}}{\textcircled{1}}, \frac{ar^5}{ar^2} = \frac{54}{2}$$

$$r^3 = 27$$

$$r = 3$$

$$(b) \quad \text{Gantikan ke dalam } \textcircled{1} / \text{Substitute into } \textcircled{1},$$

$$a(3)^2 = 2$$

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

$$14 \quad (a) \quad \frac{x}{6} = \frac{24}{x}$$

$$x^2 = 144$$

$$x = 12$$

$$(b) \quad r = \frac{12}{6} = 2$$

$$S_7 = \frac{6(2^7 - 1)}{2 - 1}$$

$$= 762$$

$$15 \quad S_n = 1562$$

$$\frac{162 \left[\left(\frac{4}{3} \right)^n - 1 \right]}{\frac{4}{3} - 1} = 1562$$

$$\left(\frac{4}{3} \right)^n - 1 = \frac{781}{243}$$

$$\left(\frac{4}{3} \right)^n = \frac{1024}{243}$$

$$\left(\frac{4}{3} \right)^n = \left(\frac{4}{3} \right)^5$$

$$n = 5$$

$$16 \quad a = 35, r = -\frac{2}{5}$$

$$r_\infty = \frac{35}{1 + \frac{2}{5}}$$

$$= 25$$

$$17 \quad 0.236363636 \dots$$

$$= 0.2 + 0.036 + 0.00036 + 0.0000036 + \dots$$

$$= \frac{1}{5} + \frac{0.036}{1 - 0.01}$$

$$= \frac{1}{5} + \frac{2}{55}$$

$$= \frac{13}{55}$$

$$18 \quad (a) \quad S_3 = 0.973S_\infty$$

$$\frac{a(1-r^3)}{1-r} = 0.973 \left(\frac{a}{1-r} \right)$$

$$1-r^3 = 0.973$$

$$r^3 = 0.027$$

$$r = 0.3$$

$$(b) \quad T_1 - T_2 = 21$$

$$a - a(0.3) = 21$$

$$0.7a = 21$$

$$a = 30$$

$$19 \quad (a) \quad \pi(4)^2, \pi(6)^2, \pi(9)^2$$

$$16\pi, 36\pi, 81\pi$$

$$(b) \quad r = \frac{36\pi}{16\pi}$$

$$r = \frac{9}{4} \text{ atau/or } 2.25$$

$$20 \quad a = 350\,000, r = 1.06$$

$$T_n > 800\,000$$

$$(350\,000)(1.06)^{n-1} > 800\,000$$

$$\lg 1.06^{n-1} > \lg \frac{16}{7}$$

$$(n-1)\lg 1.06 > \lg \frac{16}{7}$$

$$n-1 > 14.19$$

$$n > 15.19$$

$$n = 16$$

$$\therefore \text{Tahun/Year } 2027$$

Praktis Sumatif

Kertas 1

$$1 \quad (a) \quad (i) \quad S_n = 504$$

$$\frac{n}{2}(9+75) = 504$$

$$n = 12$$

$$(ii) \quad T_{12} = 75$$

$$9 + 11d = 75$$

$$11d = 66$$

$$d = 6$$

$$(b) \quad \frac{16}{y} = r$$

$$\frac{16}{y^2} = 1$$

$$y^2 = 16$$

$$y = \pm 4$$

$$2 \quad (a) \quad q - (2-p) = 3p - q$$

$$2q = 2p + 2$$

$$q = p + 1$$

$$(b) \quad d = p + 1 - (2-p)$$

$$= 2p - 1$$

$$S_9 = 360$$

$$\frac{9}{2}[2(2-p) + 8(2p-1)] = 360$$

$$4 - 2p + 16p - 8 = 80$$

$$14p - 4 = 80$$

$$14p = 84$$

$$p = 6$$

$$3 \text{ (a)} \quad r = \frac{x}{2}$$

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

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

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

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

(b) Kaedah/Method 1:

$$T_6 + \dots + T_{13} = S_{13} - S_5$$

$$\frac{13}{2}[2(5) + 12d] - \frac{5}{2}[2(5) + 4d] = 516$$

$$40 + 40d + 28d = 516$$

$$40 + 68d = 516$$

$$68d = 476$$

$$d = 7$$

Kaedah/Method 2:

$$T_6 = 5 + 5d$$

$$\frac{8}{2}[2(5 + 5d) + 7d] = 516$$

$$40 + 40d + 28d = 516$$

$$40 + 68d = 516$$

$$68d = 476$$

$$d = 7$$

$$4 \text{ (a)} \quad T_5 = 2m + 1$$

$$a + 4(3) = 2m + 1$$

$$a + 12 = 2m + 1$$

$$a = 2m - 11 \dots \textcircled{1}$$

$$S_6 = 10m - 3$$

$$\frac{6}{2}[2a + 5(3)] = 10m - 3$$

$$3(2a + 15) = 10m - 3$$

$$6a + 45 = 10m - 3$$

$$6a = 10m - 48 \dots \textcircled{2}$$

Gantikan $\textcircled{1}$ ke dalam $\textcircled{2}$ /Substitute $\textcircled{1}$ into $\textcircled{2}$,

$$6(2m - 11) = 10m - 48$$

$$12m - 66 = 10m - 48$$

$$2m = 18$$

$$m = 9$$

$$(b) S_{\infty} = 4T_2$$

$$\frac{a}{1 - r} = 4ar$$

$$1 = 4r - 4r^2$$

$$4r^2 - 4r + 1 = 0$$

$$(2r - 1)^2 = 0$$

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

$$5 \text{ (a) (i)} \quad T_5 = S_5 - S_4$$

$$= 45\left(1 - \frac{1}{3^5}\right) - 45\left(1 - \frac{1}{3^4}\right)$$

$$= \frac{1210}{27} - \frac{400}{9}$$

$$= \frac{10}{27}$$

$$(ii) S_{\infty} = 45\left(1 - \frac{1}{3^{\infty}}\right)$$

$$= 45$$

(b) (i) Kaedah/Method 1:

$$S_n = \frac{n}{2}[54 - 6(1) + 54 - 6n]$$

$$S_n = 51n - 3n^2$$

Kaedah/Method 3:

$$a = 54 - 6(1)$$

$$= 48$$

$$d = -6$$

$$S_n = \frac{n}{2}[2(48) + (n - 1)(-6)]$$

$$S_n = \frac{n}{2}[102 - 6n]$$

$$S_n = 51n - 3n^2$$

(ii) Kaedah/Method 1:

$$T_{n+1} = 0$$

$$54 - 6(n + 1) = 0$$

$$n + 1 = 9$$

$$n = 8$$

Kaedah/Method 2:

$$S_n = S_{n+1}$$

$$51n - 3n^2 = 51(n + 1) - 3(n + 1)^2$$

$$51n - 3n^2 = 51n + 51 - 3(n^2 + 2n + 1)$$

$$51n - 3n^2 = 51n + 51 - 3n^2 - 6n - 3$$

$$48 - 6n = 0$$

$$n = 8$$

$$6 \text{ (a)} \quad S_2 = 30$$

$$\frac{a(r^2 - 1)}{r - 1} = 30 \dots \textcircled{1}$$

$$T_3 - T_1 = 15$$

$$ar^2 - a = 15$$

$$a(r^2 - 1) = 15 \dots \textcircled{2}$$

$$\frac{a(r^2 - 1)}{r - 1}$$

$$\frac{\textcircled{1}}{\textcircled{2}} = \frac{r - 1}{a(r^2 - 1)} = \frac{30}{15}$$

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

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

Gantikan ke dalam $\textcircled{2}$ /Substitute into $\textcircled{2}$,

$$a\left[\left(\frac{3}{2}\right)^2 - 1\right] = 15$$

$$\frac{5}{4}a = 15$$

$$a = 12$$

(b) Biar p dan q masing-masing mewakili sebutan pertama janjang geometri P dan Q .

Let p and q represent the first term of geometric progressions P and Q respectively.

$$S_{\infty P} = 3S_{\infty Q}$$

$$\frac{p}{1 - \frac{2}{3}} = 3 \times \frac{q}{1 - \frac{1}{2}}$$

$$3p = 3 \times 2q$$

$$p = 2q \dots \textcircled{1}$$

$$T_{2P} - 2T_{2Q} = 9$$

$$p\left(\frac{2}{3}\right) - 2q\left(\frac{1}{2}\right) = 9$$

$$\frac{2}{3}p - q = 9$$

$$2p - 3q = 27 \dots \textcircled{2}$$

Gantikan ① ke dalam ②/Substitute ① into ②,
 $2(2q) - 3q = 27$
 $q = 27$

Gantikan ke dalam ①/Substitute into ①,
 $p = 2(27)$
 $= 54$

Kertas 2

1 (a) $\pi(2)^2(3), \pi(2)^2(5), \pi(2)^2(7)$
 $= 12\pi, 20\pi, 28\pi$
 $d = 20\pi - 12\pi$

$$= 8\pi$$

$$T_{11} = 12\pi + 10(8\pi)$$

$$= 92\pi$$

Isi padu/Volume = $92\pi \text{ cm}^3$

(b) $\frac{n}{2}[2(12\pi) + (n-1)(8\pi)] = 396\pi$

$$n[12\pi + 4\pi n - 4\pi] = 396\pi$$

$$4\pi n^2 + 8\pi n - 396\pi = 0$$

$$\div 4\pi, n^2 + 2n - 99 = 0$$

$$(n+11)(n-9) = 0$$

$$\therefore n = 9$$

2 (a) $T_1 = \frac{1}{2}\pi x^2$

$$T_2 = \frac{1}{2}\pi \left(\frac{1}{2}x\right)^2$$

$$= \frac{1}{8}\pi x^2$$

$$\frac{1}{8}\pi x^2$$

$$r = \frac{\frac{1}{8}\pi x^2}{\frac{1}{2}\pi x^2}$$

$$= \frac{1}{4}$$

(b) $\left(\frac{1}{2}\pi x^2\right)\left(\frac{1}{4}\right)^3 = 2\pi$

$$\frac{1}{128}\pi x^2 = 2\pi$$

$$x^2 = 256$$

$$x = 16$$

Jejari/Radius = 16 cm

(c) $S_\infty = \frac{128\pi}{1 - \frac{1}{4}}$

$$= \frac{512}{3}\pi \text{ cm atau/or } 170\frac{2}{3}\pi \text{ cm}^2$$

3 (a) $a = 3, l = 37$

$$S_n = 360$$

$$\frac{n}{2}(3 + 37) = 360$$

$$20n = 360$$

$$n = 18$$

$$T_{18} = 37$$

$$3 + 17d = 37$$

$$17d = 34$$

$$d = 2$$

(b) Kaedah/Method 1:

$$T_{11} + \dots + T_{18}$$

$$= S_{18} - S_{10}$$

$$= \frac{18}{2}[2(3) + 17(2)] - \frac{10}{2}[2(3) + 9(2)]$$

$$= 360 - 120$$

$$= 240$$

Kaedah/Method 2:

$$T_{11} = 3 + (10)(2)$$

$$= 23$$

$$S_8 = \frac{8}{2}(23 + 37)$$

$$= 240$$

4 (a) $a = 64, r = 1.5$

$$T_6 = 64(1.5)^5$$

$$= 486$$

$$\text{Yuran/Fee} = 486 \times \text{RM}80$$

$$= \text{RM}38\,880$$

(b) $S_n > 2\,000$

$$\frac{64(1.5^n - 1)}{1.5 - 1} > 2\,000$$

$$(1.5)^n > 16.625$$

$$n \log(1.5) > \log(16.625)$$

$$n > 6.933$$

$$n = 7$$

Julai/July

5 (a) $a = p, d = q$

$$T_6 = 35$$

$$p + 5q = 35$$

$$p = 35 - 5q \dots \textcircled{1}$$

$$S_{10} = 330$$

$$\frac{10}{2}[2p + 9q] = 330$$

$$2p + 9q = 66 \dots \textcircled{2}$$

Gantikan ① ke dalam ②/Substitute ① into ②,

$$2(35 - 5q) + 9q = 66$$

$$70 - 10q + 9q = 66$$

$$q = 4$$

Gantikan ke dalam ①/Substitute into ①,

$$p = 35 - 5(4)$$

$$= 15$$

(b) A: $a = 15, d = 4, B: a = 8, d = 5$

(i) $S_{nA} = S_{nB}$

$$\frac{n}{2}[2(15) + (n-1)(4)] = \frac{n}{2}[2(8) + (n-1)(5)]$$

$$n[4n + 26] = n[5n + 11]$$

$$4n^2 + 26n = 5n^2 + 11n \text{ atau/or } 4n + 26 = 5n + 11$$

$$n^2 - 15n = 0$$

$$n(n - 15) = 0$$

$$n \neq 0, \therefore n = 15$$

(ii) $S_{15} = \frac{15}{2}[2(15) + (14)(4)]$

atau/or

$$\frac{15}{2}[2(8) + (14)(5)]$$

$$= 645 \text{ m}$$

$$6 \text{ (a) } T_1 + T_2 = 24$$

$$a + ar = 24$$

$$a(1 + r) = 24 \dots \textcircled{1}$$

$$T_3 = 54$$

$$ar^2 = 54 \dots \textcircled{2}$$

$$\frac{\textcircled{2}}{\textcircled{1}}, \frac{ar^2}{a(1+r)} = \frac{54}{24}$$

$$\frac{r^2}{1+r} = \frac{9}{4}$$

$$4r^2 - 9r - 9 = 0$$

$$(4r + 3)(r - 3) = 0$$

$$r > 0, \therefore r = 3$$

Gantikan ke dalam $\textcircled{2}$ /Substitute into $\textcircled{2}$,

$$a(3)^2 = 54$$

$$a = 6$$

$$(b) S_7 = \frac{6(3^7 - 1)}{3 - 1}$$

$$= 6558$$

$$7 \text{ (a) } T_1 = 6x^2$$

$$T_2 = 6\left(\frac{2}{3}x\right)^2$$

$$= \frac{8}{3}x^2$$

$$T_3 = 6\left(\frac{4}{9}x\right)^2$$

$$= \frac{32}{27}x^2$$

$$\frac{T_2}{T_1} = \frac{\frac{8}{3}x^2}{6x^2} = \frac{4}{9}$$

$$\frac{T_3}{T_2} = \frac{\frac{32}{27}x^2}{\frac{8}{3}x^2} = \frac{4}{9}$$

$$\therefore \frac{T_3}{T_2} = \frac{T_2}{T_1}$$

\therefore Janjang geometri dengan $r = \frac{4}{9}$.

Geometric progression with $r = \frac{4}{9}$.

$$(b) \text{ Kaedah/Method 1:}$$

$$S_3 = 3192$$

$$\frac{6x^2\left(1 - \left(\frac{4}{9}\right)^3\right)}{1 - \frac{4}{9}} = 3192$$

$$\frac{266}{27}x^2 = 3192$$

$$x^2 = 324$$

$$x = 18$$

Kaedah/Method 2:

$$6x^2 + \frac{8}{3}x^2 + \frac{32}{27}x^2 = 3192$$

$$x^2 = 324$$

$$x = 18$$

$$(c) a = 6(18)^2$$

$$= 1944$$

$$T_n < 10$$

$$1944\left(\frac{4}{9}\right)^{n-1} < 10$$

$$\lg\left(\frac{4}{9}\right)^{n-1} < \lg\frac{5}{972}$$

$$(n-1)\lg\left(\frac{4}{9}\right) < \lg\frac{5}{972}$$

$$n > 7.50$$

$$n = 8$$

$$8 \text{ (a) (i) } T_3 = a + 2d$$

$$T_7 = a + 6d$$

$$a, a + 2d, a + 6d$$

$$\frac{a + 2d}{a} = \frac{a + 6d}{a + 2d}$$

$$(a + 2d)^2 = a(a + 6d)$$

$$a^2 + 4ad + 4d^2 = a^2 + 6ad$$

$$4d^2 - 2ad = 0$$

$$2d(2d - a) = 0$$

$$d \neq 0, \therefore a = 2d$$

$$(ii) r = \frac{a + 2d}{a}$$

$$r = \frac{2d + 2d}{2d}$$

$$= 2$$

$$(b) a(2)^4 = 48$$

$$a = 3$$

$$3 = 2d$$

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

$$S_9 = \frac{9}{2}\left[2(3) + 8\left(\frac{3}{2}\right)\right]$$

$$= 81$$