AC Math $\frac{8.2.1}{\text{Cimito}}$ G/Seq.

p256/5 term n $K+4$
term n+1 $5K+4$
term n+2 $K+20$

so $\frac{5K+4}{K+4}$ = ratio = $\frac{K+20}{5K+4}$

so $\frac{5K+4}{K+4} = \frac{K+20}{5K+4}$

$(5K+4)^2 = (K+4)(K+20)$

$25K^2+40K+16 = K^2+24K+80$

$24K^2+16K-64=0$

$8(3K^2+2K-8)=0$

$8(3K-4)(K+2)=0$

$\therefore K = 4/3$ or $K=-2$

Q7 $u_1 + u_3 = 40$ $u_6 = ?$
$u_2 + u_4 = 96$

$u_3 = u_1 \times r \times r = u_1 r^2 \Rightarrow u_1 + u_1 r^2 = 40$
$u_4 = u_2 \times r \times r = u_2 r^2 \Rightarrow u_2 + u_2 r^2 = 96$

so $u_1(1+r^2) = 40$
$u_2(1+r^2) = 96$

$\therefore \frac{u_2 \cancel{(1+r^2)}}{u_1 \cancel{(1+r^2)}} = \frac{96}{40}$

$\frac{u_2}{u_1} = r = \frac{96}{40} = \frac{12}{5}$

then $\frac{40}{1+r^2} = u_1 \Rightarrow u_1 = \frac{40}{1+\left(\frac{12}{5}\right)^2} = \frac{1000}{169}$

then $u_6 = u_1 r^5 = \left(\frac{4000}{169}\right)\left(\frac{12}{5}\right)^5 = \frac{248,832,000}{1?2,528,125}$

8 $u_1 + u_2 + u_3 = 35/2 \Rightarrow u_1 + u_1 r + u_1 r^2 = 35/2$

$u_1 \cdot u_2 \cdot u_3 = 125 \Rightarrow u_1 \cdot u_1 r \cdot u_1 r^2 = 125$

$u_1^3 r^3 = 125$

$(u_1 r)^3 = 125$

$\therefore u_1 r = 5$

$\{ u_1 = \frac{5}{r}$

use $u_1 r = 5 \Rightarrow$ thus $u_1 + 5 + u_1 r^2 = 35/2$

$u_1 + u_1 r^2 = 25/2$

$u_1(1 + r^2) = 25/2$

Likewise $u_1 \times 5 \times u_1 r^2 = 125$

$u_1^2 r^2 = 25$

so $u_1 = \sqrt{\frac{25}{r^2}} = \frac{5}{r}$

So $\frac{5}{r} + 5 + 5r = \frac{35}{2}$

$5\left(\frac{1}{r} + 1 + r\right) = \frac{35}{2}$

$\frac{1}{r} + 1 + r = \frac{7}{2}$

$\left(\frac{1}{r} + r = \frac{5}{2}\right) 2r$

$2 + 2r^2 = 5r$

$2r^2 - 5r + 2 = 0$

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

$r = 1/2 \quad r = 2$

$\therefore u_1 = \frac{5}{1/2}$ or $\frac{5}{2} \Rightarrow 10$; 5

$u_1 = \ldots \quad 5 \quad \Rightarrow$

HL Math Cvnto 8.1.1 A/Seq

10 $u_n = 4-\sqrt{3}$

$u_{n+1} = x = u_n + d$

$u_{n+2} = y = u_n + 2d = u_{n+1} + d$

$u_{n+3} = 2\sqrt{3} - 2 = u_n + 3d$

so $3d =$ using first term + 4th term

$3d = (2\sqrt{3}-2) - (4-\sqrt{3})$

$3d = 3\sqrt{3} - 6$

$\boxed{d = \sqrt{3} - 2}$

then $u_{n+1} = x = (4-\sqrt{3}) + (\sqrt{3}-2)$

$\boxed{x = 2}$

$u_{n+2} = y = u_n + 2d$

$= (4-\sqrt{3}) + 2(\sqrt{3}-2)$

$\boxed{y = -\sqrt{3}}$

12 $u_3 = x+y$

$u_5 = x-y$

$u_{12} = ?$

but $u_5 = u_3 + 2d$

so $d = \dfrac{u_5 - u_3}{2}$

$= \dfrac{(x-y)-(x+y)}{2}$

$d = -y$

then $u_{12} = u_5 + 7d$

$= (x-y) + 7(-y)$

$\boxed{u_{12} = x - 8y}$

HL Math Civnito 8.1.1 A/Seq

13 $u_5 + 2u_3 = u_{12}$

$u_7 = 25$

$u_n = ?$

$u_5 = u_1 + 4d$

$u_3 = u_1 + 2d$

$u_{12} = u_1 + 11d$

$u_7 = u_1 + 6d$

so $(u_1 + 4d) + 2(u_1 + 2d) = u_1 + 11d$

$2u_1 = 3d$

$\therefore u_1 = \frac{3}{2}d$

then $u_7 = u_1 + 6d = 25$

$\frac{3}{2}d + 6d = 25$

$3d + 12d = 50$

$d = 50/15 = 10/3$

so $u_1 = \frac{3}{2} \times \frac{10}{3} = 5$

$\therefore u_n = 5 + (n-1)\,10/3$

$u_n = \frac{10}{3}n - \frac{5}{3}$