Ch.12 Review Set A

(2) a) $u_1 = 68 - 5(1) = 63$
$u_2 = 58$
$u_3 = 53$
$u_4 = 48$

There is a common difference of -5 so the sequence is arithmetic

b) $u_1 = 63$
$d = -5$

c) $u_{37} = 68 - 5(37) = -117$

d) use Best Friend $u_n = u_1 + d(n-1)$

$-200 = 63 + -5(n-1)$

solve

$-263 = -5(n-1)$

$n - 1 = 52.6$

$n = 53.6$

so the 53rd term is -197

The 54th term is the 1st term less than -200

(3) a) 3, 12, 48, 192 $\quad \frac{192}{48} = 4 \quad \frac{48}{12} = 4 \quad \frac{12}{3} = 4$

Geometric since there is a common ratio of 4

b) $u_n = 3(4)^{n-1}$ and $u_9 = 3(4)^{9-1} = 196,608$

Review Set A continues

(4) $3K, K-2, K+7$

If geometric $\frac{K+7}{K-2}$ has to be equal to $\frac{K-2}{3K}$

$$\frac{K+7}{K-2} = \frac{K-2}{3K}$$

$$3K(K+7) = (K-2)(K-2)$$

$$3K^2 + 21K = K^2 - 4K + 4$$

$$2K^2 + 25K - 4 = 0$$

solve quadratic

factor or use quad. formula or just graph to solve by finding x-intercept

$K = -5.5$

(5) $u_7 = 31 \quad u_{15} = -17$ then find u_{34}

$31 = u_1 + d(7-1)$

$31 = u_1 + 6d$

$-17 = u_1 + d(15-1)$

$-17 = u_1 + 14d$

Solve system using an Algebraic method or graphically on your GDC

$u_1 = 67$

$d = -6$

$u_n = 67 - 6(n-1)$ ← general term

$u_{34} = 67 - 6(34-1)$

$= -131$

Ch. 12 Review Set B

(1) $24, 23\frac{1}{4}, 22\frac{1}{2}, \ldots\ldots -36$ ← Arithmetic $d = -.75$

a) $u_n = u_1 + d(n-1)$

$-36 = 24 + -.75(n-1)$

$-24 \quad -24$

$-60 = -.75(n-1)$

divide by $-.75$

$80 = n-1$

$n = 81$ → so there are 81 terms

b) $u_{35} = 24 - .75(35-1) = \underline{-1.5}$

c) $S_{81} = \frac{n}{2}(u_1 + u_n) = \frac{81}{2}(24 + -36) = \underline{-486}$

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(6) a) $FV = 12500\left(1 + \frac{8.25}{2(100)}\right)^{2.5} = \boxed{18,726.65}$

b) $k=12$ $FV = 12500\left(1 + \frac{8.25}{12(100)}\right)^{12.5} = \boxed{18,855.74}$

wrong question (in)

(6) a) annually $FV = 6000\left(1 + \frac{7}{1(100)}\right)^{1.5} =$ 8,415 euro or 8415.31 euro

b) quarterly $FV = 6000\left(1 + \frac{7}{4(100)}\right)^{4.5} =$ 8,488.67 or 8489 euro

c) monthly $FV = 6000\left(1 + \frac{7}{12(100)}\right)^{12.5} =$ 8505.75 or 8506 euro

(8) 3% pay raise each year means there is a multiplier of $(100\% + 3\%)$ 1.03

a) there is no compounding of interest

$$U_5 = 50000(1.03)^{5-1} = 56,275.44$$

or 56,275 euro

b) $60000 = 50000(1.03)^{t-1}$

divide

$$1.03^{t-1} = \frac{6}{5}$$

take log of both sides

$$\log(1.03^{t-1}) = \log(6/5)$$

$$(t-1)\cdot \log(1.03) = \log(\tfrac{6}{5})$$

$$t-1 = \frac{\log(6/5)}{\log(1.03)}$$

$$t-1 = 6.168\ldots$$

$$t = 7.168$$

so the value will reach 60 000 euro after 7 full years, during the 8th year