11.1)

1) a) sequence: "a list of numbers written in a definite order"
for every positive integer 'n' there is a corresponding number 'a_n'

b) $\lim_{n\to\infty} a_n = 8$: as n becomes large, a_n approaches 8

c) ∞ : continues to grow unbounded

3)

n	1	2	3	4	5
$a_n = \frac{2n}{n^2+1}$	$2/3$	$4/5$	$6/10 = 3/5$	$8/17$	$10/26 = 5/13$

5)

n	1	2	3	4	5
$a_n = \frac{(-1)^{n-1}}{5^n}$	$1/5$	$-1/25$	$1/125$	$-1/625$	$1/5^5$

9)

	a_1	a_2	a_3	a_4	a_5
$a_{n+1} = 5a_n - 3$	1	2	7	32	157

11)

	a_1	a_2	a_3	a_4	a_5
$a_{n+1} = \frac{a_n}{1+a_n}$	2	$2/3$	$\frac{2/3}{5/3} = 2/5$	$\frac{2/5}{7/5} = 2/7$	$\frac{2/7}{9/7} = 2/9$

15) $\{-3,\ 2,\ -\frac{4}{3},\ \frac{8}{9},\ -\frac{16}{27}, \dots\}$ $\qquad (-1)^n\left(\frac{2}{3}\right)^{n-1}(3)$

$\{a_1,\ a_2,\ a_3,\ a_4,\ a_5, \dots\}$ $\qquad (-1)^n\left(\frac{2}{3}\right)^n\left(\frac{2}{3}\right)^{-1}(3)$

$\frac{2}{-3} = -\frac{2}{3}$, $\frac{-4/3}{2} = -\frac{2}{3}$, $\frac{8/9}{-4/3} = -\frac{2}{3}$, $\frac{-16/27}{8/9} = -2/3$ $\qquad \left(-\frac{2}{3}\right)^n\left(\frac{3}{2}\right)(3) = \boxed{\frac{9}{2}\left(-\frac{2}{3}\right)^n}$

$a_5 = \left(\frac{9}{2}\right)\left(-\frac{2}{3}\right)^5 = \frac{\cancel{9}}{\cancel{2}}(-1)\left(\frac{\cancel{2}\cdot 16}{\cancel{9}\cdot 27}\right) = -\frac{16}{27}$ ✓

28) $\lim_{n\to\infty}\left(\frac{3^{n+2}}{5^n}\right) = \lim_{n\to\infty}\left(\frac{3^n 3^2}{5^n}\right) = \lim_{n\to\infty} 9\left(\frac{3}{5}\right)^n = 0 \quad r = \frac{3}{5} < 1 \quad \therefore$ convergent

65)

	a_1	a_2	a_3	a_4	a_5
$a_n = 1000(1.06^n)$	1060	1123.60	1191.02	1262.48	1338.23

divergent

67)

	P_0	P_1	P_2	P_3	P_4	P_5	P_6
$P_n = 1.08P_{n-1} - 300$	5000	5100	5208	5324.	5450	5586	5733

67) $\frac{dP}{dt} = +P(.08) - H$, $H = 300$

$\frac{8P}{100} - \frac{100H}{100}$

$\frac{1}{8P-100H}\,dP = \frac{1}{100}\,dt$

$\frac{1}{8}\ln|8P-100H| = \frac{t}{100} + C_1$

$\ln|8P-100H| = \frac{2t}{25} + C_2$

$|8P-100H| = C_3 e^{\frac{2t}{25}}$

$8P - 100H = C_4 e^{2t/25}$

$P(t) = \frac{1}{8}\left(C_4 e^{\frac{2t}{25}} + 100H\right)$

$P(0) = 5000 = \frac{1}{8}\left(C_4 + (300)(100)\right)$

$C_4 = 10000$

$P(t) = \frac{1}{8}\left(10000 e^{\frac{2t}{25}} + 30000\right)$

$P(t) = 1250\left(e^{\frac{2t}{25}} + 3\right)$

$\boxed{P(0) = 1250(1 + 3) = 5000}$

$\boxed{P(6) = 1250(e^{12/25} + 3) = 5770}$

$\frac{5770}{5733} \approx 1.006$ - within 1%