$$
\begin{aligned}
& \begin{array}{c}
\text { Arithmetic } \\
t_{n}=a+(n-1) d \\
S_{n}=\frac{n}{2}(2 a+(n-1) d) \\
S_{n}=\frac{n}{2}\left(a+t_{n}\right) \\
S_{n}=\frac{a\left(r^{n}-1\right)}{r-1} \\
\hline
\end{array} \\
& \begin{array}{c}
\text { Geometric } \\
S_{n}=\frac{a}{1-r} \\
\text { (Common Ratio "r") }
\end{array} \\
& t_{n}=a r^{n-1}
\end{aligned}
$$

$$
\begin{aligned}
& \text { (1) (1) }-\frac{2}{3}+\frac{4}{9}-\frac{8}{27}+\cdots \\
& \begin{aligned}
a=1 & s_{n}
\end{aligned}=\frac{a}{1-r} \\
& r=\frac{-2}{3} \quad \\
& \\
& =\frac{1}{1-(-2)} \\
& \\
& \\
& =\frac{1}{5 / 3} \\
& \\
&
\end{aligned}
$$

$$
\begin{aligned}
& \text { c) }\left(\frac{1}{4}-\frac{5}{16}+\frac{25}{64}-\frac{125}{256}+\ldots\right. \\
& a=\frac{1}{4} \quad \text { Divergent ( } r \text { is too small) } \\
& r=\frac{-5}{4}
\end{aligned}
$$

(2)

$$
\begin{aligned}
& \left.\sum_{n=1}^{\infty}\left(-\frac{2}{5}\right)^{n}=\frac{-2}{5}\right)+\frac{4}{25}-\frac{8}{125}+\frac{16}{655}-\ldots \\
& a=-\frac{\partial}{5} \quad s_{n}=\frac{-\partial / 5}{1-(-\partial / 3)} \\
& r=\frac{4}{23} \div-\frac{2}{5} \\
& =\frac{2}{580} \times \frac{5}{31} \\
& =\frac{\frac{-2}{5}}{7 / 5} \\
& =-\frac{2}{5} \\
& =\frac{-2}{5} \times \frac{5}{7} 2 \\
& =\frac{-2}{7}
\end{aligned}
$$

Series + Sequence
Review
(2)

$$
,-,-,-,
$$

$$
a=12000
$$

$$
t_{6}=91185
$$

$$
n=6
$$

$$
r=?
$$

$$
\begin{array}{rlrl}
12000 & & \cdots \\
000 & t_{n} & =a r^{n-1} \\
11125 & \frac{91125}{12000} & =\frac{12000 r^{6-1}}{12000} \\
7.5935 & =r^{5} \\
1.5 & =r
\end{array}
$$

* Annual rate of Increase:

$$
1.5-1=0.5 \times 100=50 \%
$$

(4)

$$
\begin{aligned}
& t_{1}=3 \quad t_{2}=\left(t_{2-1}\right)^{2} \quad t_{3}=81 \\
& t_{n}=\left(t_{n-1}\right)^{0} \\
& -\left(t_{1}\right)^{2} \quad t_{4}=6561 \\
& =(3)^{8} \quad t_{s}=43046721 \\
& =9
\end{aligned}
$$

(4) $t_{1}=3 \quad t_{n}=\left(t_{n-1}\right)^{2}$ "recursive rules" previous term

$$
\begin{array}{rlrl}
t_{\partial} & =\left(t_{2-1}\right)^{2} & t_{3} & =\left(t_{2}\right)^{2} \\
& =\left(t_{1}\right)^{2} & & =(9)^{2} \\
& =(3)^{2} & & =81 \\
& =9 &
\end{array}
$$

$$
\begin{aligned}
& \text { (5) c) } 4+8+12+\ldots+400 \\
& a=4 \\
& \text { Solve for " } n \text { " } \\
& d=4 \\
& t_{n}=a+(n-1) d \\
& t_{n}=400 \\
& 400=4+(n-1)(4) \\
& S_{n}=\text { ? } \\
& 400=4+4 n-4 \\
& 400=4 n \\
& 100=n \\
& S_{n}=\frac{n}{2}\left(a+t_{n}\right) \\
& S_{100}=\frac{100}{2}(4+400) \\
& S_{100}=50(404) \\
& S_{100}=20200 \\
& \text { (5)al } \\
& \sum_{n=1}^{5} 2 n+1 \\
& =3+5+7+9+11 \\
& =35
\end{aligned}
$$

$$
\begin{aligned}
& \text { (6) } \quad t_{5}=16 \quad t_{8}=25 \quad t_{n}=a+(n-1) d \\
& \begin{array}{l|l}
t_{5}=a+(5-1) d & t_{8}=a+(8-1) d \\
t_{5}=a+4 d & t_{8}=a+7 d \\
\hline a+4 d=16 & a+7 d=25 \\
\hline
\end{array} \\
& \begin{array}{r}
a+7 d=25 \\
\begin{array}{r}
a+4 d=16
\end{array} \\
\hline 3 d=9 \\
d=3
\end{array} \begin{array}{l}
a+4 d=16 \\
a+4(3)=16 \\
a+1 \partial=16 \\
a=4
\end{array}\left[\begin{array}{l}
t_{n}=a+(n-1) d \\
t_{n}=4+(n-1) 3 \\
t_{n}=4+3 n-3
\end{array}\right. \\
& t_{n}=3 n+1
\end{aligned}
$$

$$
\begin{aligned}
& \begin{array}{l|ll}
\text { (7) } t_{5}=48 & t_{8}=384 & t_{n}=a r^{n-1} \\
t_{5}=a r^{5-1} & t_{8}=a r^{8-1} \\
t_{5}=a r^{4} & t_{8}=a r^{7} \\
\hline a r^{4}=48 & a r^{7}=384 \\
\hline
\end{array} \\
& \begin{array}{l}
a r^{7}=384 \\
a r^{4}=48 \\
r^{3}=8 \\
r=2
\end{array} \begin{array}{c}
a r^{4}=48 \\
a(2)^{4}=48 \\
16 a=48 \\
a=3
\end{array} \quad \begin{array}{l}
t_{n}=a r^{n-1} \\
t_{n}=(3)(2)^{n-1}
\end{array}
\end{aligned}
$$

(8) $\frac{5}{8}, \frac{5}{2}, 10, \cdots, 640$.

$$
\begin{array}{ll}
a=\frac{5}{8} & t_{n}=a r^{n-1} \\
r=4 & 640=\frac{5(4)^{n-1}}{8}+\frac{\log 1024}{\log 4}=5 \\
t_{n}=640 & 1024=4^{n-1} \\
& 4^{3}=4^{n-1} \\
& 5=n-1 \\
& 6=n
\end{array}
$$

Sts Review 2

$$
\begin{aligned}
& \text { (1) } t_{18}=15 \\
& t_{n}=a+(n-1) d \\
& t_{1 a}=a+(12-1) d \\
& t_{12}=a+11 d \\
& a+11 d=15 \\
& \begin{array}{r}
a+1 b=15 \\
+7 d=7 \\
\hline 4 d=8 \\
d=2
\end{array} \\
& \begin{array}{r}
a+1 b=15 \\
+7 d=7 \\
\hline 4 d=8 \\
d=2
\end{array} \\
& S_{15}=105 \\
& S_{n}=\frac{n}{\partial}(2 a+(n-1) d) \\
& S_{s}=\frac{15}{2}(2 a+(15-1) d) \\
& s_{s}=75(2 a+14 d) \\
& S_{i s}=15 a+105 d \\
& 15 a+105 d=105
\end{aligned}
$$

