18.2

12.(a) $r=3, a=3 \Rightarrow S=\frac{3-3^{21}}{1-3}=5230176600$ (infinite sum diverges as $|r|>1$)

(b) $r=\frac{2}{3}, a=\frac{2}{3}, \Rightarrow$ converges to $\frac{\frac{2}{3}}{1-(\frac{2}{3})}=2$

(c) $r=10 \Rightarrow |r|>1 \Rightarrow$ diverges

(d) $r=0.8, a=3, \Rightarrow$ converges to $\frac{3}{1-(0.8)}=\frac{3}{0.2}=15$

(e) $r=1.3 \Rightarrow |r|>1 \Rightarrow$ diverges

(f) $r=x^2, a=1, \Rightarrow$ converges to $\frac{1}{1-(x^2)}$ for $-1<x<1$

13.(a) $r=\frac{3}{8}, a=-\frac{4}{3}, \Rightarrow$ converges to $\frac{-\frac{4}{3}}{1-\frac{3}{8}}=-\frac{32}{15}$

(b) $r=-\frac{1.1}{100}=-\frac{11}{1000}, a=-\frac{1}{100}, \Rightarrow$ converges to $\frac{-\frac{1}{100}}{1-(-\frac{11}{1000})}=-\frac{10}{1011}$

(c) $r=-\frac{10}{11}, a=-\frac{7}{10000}, \Rightarrow$ converges to $\frac{-\frac{7}{10000}}{1-(-\frac{10}{11})}=-\frac{11}{30000}$

(d) $r=-x, a=1, \Rightarrow$ converges to $\frac{1}{1-(-x)}=\frac{1}{1+x}$ for $|x|<1$

14.(a) $r=0.1, a=2, \Rightarrow 2.222\overline{2}\cdots=\frac{2}{1-0.1}=\frac{20}{9}$

(b) first we separate the 3 from the rest of the sum, then
$3.12\overline{1}\overline{2}\cdots=3+\frac{0.12}{1-0.01}=3+\frac{4}{33}=\frac{103}{33}$ (used $r=0.01$, $a=0.12$)