Name: Date:

1. (a) $\boxed{1.1}$
   (b) $\boxed{\frac{1}{2}}$
   (c) $\boxed{a^2}$
   (d) $\boxed{\text{No}}$

2. (a) $\boxed{r = -\frac{1}{12}, a_5 = \frac{1}{144}, a_n = 144(-\frac{1}{12})^{n-1} = 144(-12)^{1-n}}$
   (b) $\boxed{r = 3^{2/3}, a_5 = 3^{11/3}, a_n = 3(3^{2/3})^{n-1} = 3^{(2/3)n+1/3}}$
   (c) $\boxed{r = \frac{1}{4}, a_5 = -\frac{1}{32}, a_n = -8(\frac{1}{4})^{n-1} = -2^{5-2n}}$
   (d) $\boxed{r = \frac{t}{2}, a_5 = \frac{t^5}{16}, a_n = t(\frac{t}{2})^{n-1}}$

3. (a) $\boxed{\text{Neither}}$
   (b) $\boxed{\text{Arithmetic, } 3}$
   (c) $\boxed{\text{Geometric, } 9\sqrt{3}}$
   (d) $\boxed{\text{Geometric, } 1}$
   (e) $\boxed{\text{Neither}}$
   (f) $\boxed{\text{Arithmetic, } x+3}$
   (g) $\boxed{\text{Arithmetic, } 3}$
   (h) The sequence is clearly not arithmetic. For it to be geometric it needs to have a common ratio. Let r be the common ratio. Then $r = \sqrt[3]{5} \div \sqrt{5} = 5^{\frac{1}{3}} \div 5^{\frac{1}{2}} = 5^{-\frac{1}{6}}$. But $r = \sqrt[9]{5} \div \sqrt[6]{5} = 5^{\frac{1}{9}} \div 5^{\frac{1}{6}} = 5^{-\frac{1}{18}} \neq 5^{-\frac{1}{6}}$. This means we don't have a common ratio nor a geometric sequence. $\boxed{\text{Neither}}$

4. If we let the first term be a_1, then $a_4 = 200 = a_1(r)^{4-1} = a_1(r^3)$ and $a_8 = 800 = a_1(r)^{8-1} = a_1(r^7)$. Now we have a system of equations that we can solve for a_1, r:

   $$\begin{cases} 200 &= a_1(r^3) \\ 800 &= a_1(r^7) \end{cases}$$

   Solving gives us $a_1 = 50\sqrt{2}, r = \sqrt{2}$. Then $a_6 = 50\sqrt{2}(\sqrt{2})^5 = \boxed{400}$.

   Alternatively we could have gotten the solution by noticing that since 6 is the arithmetic mean of 4 and 8, a_6 is the geometric mean of a_2 and a_8.

5. If we let the first term be a_1, then $a_2 = -2 = a_1(r)^{2-1} = a_1(r)$ and $a_5 = 16 = a_1(r)^{5-1} = a_1(r^4)$. Now we have a system of equations that we can solve for a_1, r:

$$\begin{cases} -2 & = a_1(r) \\ 16 & = a_1(r^4) \end{cases}$$

Solving gives us $a_1 = 1, r = -2$. Then $a_14 = 1(-2)^13 =$ $\boxed{\text{-8192}}$.