## 10.1 AP Practice Problems (p.721) - Sequences

1. The general term $a_n$ for the sequence

$$\left\{ 0, -\frac{1}{2}, \frac{4}{3}, -\frac{9}{4}, \frac{16}{5}, \cdots \right\} \text{ is}$$

(A) $\dfrac{(n-1)^2}{n}$

(B) $(-1)^n \dfrac{(n-1)^2}{n}$

(C) $(-1)^{n+1} \dfrac{(n-1)^2}{n}$

(D) $(-1)^n \dfrac{n^2}{n+1}$

2. Which sequence is defined by $\{b_n\} = \left\{ \left(-\dfrac{2}{3}\right)^n (n-3) \right\}$?

(A) $\dfrac{4}{3}, -\dfrac{4}{9}, \dfrac{16}{81}, -\dfrac{64}{243}, \cdots$

(B) $\dfrac{4}{3}, -\dfrac{4}{9}, 0, \dfrac{16}{81}, -\dfrac{64}{243}, \cdots$

(C) $-\dfrac{2}{3}, \dfrac{4}{9}, 0, \dfrac{16}{81}, -\dfrac{32}{243}, \cdots$

(D) $-\dfrac{2}{3}, \dfrac{4}{9}, -\dfrac{8}{27}, \dfrac{16}{81}, -\dfrac{32}{243}, \cdots$

3. The sequence $\{a_n\} = \left\{ \dfrac{2}{3n+1} \right\}$ can be described as

(A) increasing and bounded.

(B) decreasing and bounded.

(C) increasing and not bounded.

(D) decreasing and not bounded.

4. For what values of $x$ does the sequence $\{3x^n\}$ converge?

(A) $-1 < x \le 1$    (B) $-1 < x < 1$

(C) $-3 < x < 3$    (D) The sequence diverges.

5. Determine whether the sequence $\left\{ \dfrac{\sin n}{n^3} \right\}$ converges or diverges. Justify your answer.