3.5: Complex Zeroes and Fundamental of Algebra

1. If - 1 is a zero of multiplicity 2 of $P(x) = x^4 + 6x^3 + 14x^2 + 14x + k$ for some constant k, then the remaining zeros are

   A) $-2 \pm i$

   B) $-2 \pm 2i$

   C) $2 \pm i\sqrt{5}$

   D) $2 \pm i$

   E) $-2 \pm i\sqrt{5}$

2. If $3i$ is a zero of the polynomial function $g(x) = 2x^4 - x^3 + 12x^2 - 9x - 54$, then the product of all real zeros of $g(x)$ is equal to

   A) -3

   B) $-\frac{1}{2}$

   C) $\frac{3}{2}$

   D) 9

   E) -6

3. If $-i$ and i, where $i = \sqrt{-1}$, are zeros of the polynomial function $P(x) = x^4 - 2x^3 + 2x^2 - 2x + 1$, then the number of x-intercepts of the graph of $P(x)$ is

A) 1

B) 0

C) 2

D) 3

E) 4

4. If 3 is a zero of $f(x) = x^3 - x^2 - 4x - 6$, then the other zeros are

A) $1 \pm i$

B) $1 \pm 2i$

C) $-1 \pm 2i$

D) $2 \pm i$

E) $-1 \pm i$

5. Given that $-2i$ is a zero of the polynomial $p(x) = 2x^4 - x^3 + 7x^2 - 4x - 4$ then the sum of the real zeros of $p(x)$ is:

A) $\frac{1}{2}$

B) 0

C) $-\frac{1}{2}$

D) $\frac{3}{2}$

E) $-\frac{3}{2}$

6. If $1 + i$ is a zero of $P(x) = x^3 - x^2 - ix^2 - 9x + 9 + 9i$, then the product of the other zeros is

A) $9 - 9i$

B) $3 - 3i$

C) 2

D) $-3 + 3i$

E) -9