

Zeros of a Polynomial Function

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Given the polynomial function $f(x)$, find the rational zeros, then the other zeros (that is, solve the equation $f(x) = 0$), and factor $f(x)$ into linear factors.

- 1) $f(x) = x^3 - 12x - 16$ 1) _____
A) -2, multiplicity 2; 4; $f(x) = (x + 2)^2(x - 4)$
B) -2, 2, 4; $f(x) = (x + 2)(x - 2)(x - 4)$
C) -2, multiplicity 2; -4; $f(x) = (x + 2)^2(x + 4)$
D) -4, -2, 2; $f(x) = (x + 4)(x + 2)(x - 2)$
- 2) $f(x) = x^4 + 6x^3 + 7x^2 - 6x - 8$ 2) _____
A) -4, -2, 1, multiplicity 2; $f(x) = (x + 4)(x + 2)(x - 1)^2$
B) -1, 1, 2, 4; $f(x) = (x + 1)(x - 1)(x - 2)(x - 4)$
C) -4, -2, -1, 1; $f(x) = (x + 4)(x + 2)(x + 1)(x - 1)$
D) -2, -1, 1, 4; $f(x) = (x + 2)(x + 1)(x - 1)(x - 4)$
- 3) $f(x) = x^4 + 15x^3 + 49x^2 - 15x - 50$ 3) _____
A) -5, -1, 1, 10; $f(x) = (x + 5)(x + 1)(x - 1)(x - 10)$
B) -10, -5, -1, 1; $f(x) = (x + 10)(x + 5)(x + 1)(x - 1)$
C) -10, -5, 1, multiplicity 2; $f(x) = (x + 10)(x + 5)(x - 1)^2$
D) -1, 1, 5, 10; $f(x) = (x + 1)(x - 1)(x - 5)(x - 10)$
- 4) $f(x) = x^3 - 75x - 250$ 4) _____
A) -10, -5, 5; $f(x) = (x + 10)(x + 5)(x - 5)$
B) -5, multiplicity 2; -10; $f(x) = (x + 5)^2(x + 10)$
C) -5, multiplicity 2; 10; $f(x) = (x + 5)^2(x - 10)$
D) -5, 5, 10; $f(x) = (x + 5)(x - 5)(x - 10)$
- 5) $f(x) = x^3 + 3x^2 + 9x + 27$ 5) _____
A) -3, $-\sqrt{3}$, multiplicity 2; $f(x) = (x + 3)(x + \sqrt{3})^2$
B) -3, $27i$, $9i$; $f(x) = (x + 3)(x - 27i)(x - 9i)$
C) -3, $-3i$, $3i$; $f(x) = (x + 3)(x + 3i)(x - 3i)$
D) $-\sqrt{3}$, multiplicity 2; $3i$; $f(x) = (x + \sqrt{3})^2(x - 3i)$
- 6) $f(x) = x^3 + 5x^2 + 9x + 45$ 6) _____
A) -5, $-\sqrt{3}$, multiplicity 2; $f(x) = (x + 5)(x + \sqrt{3})^2$
B) $-\sqrt{5}$, multiplicity 2; $3i$; $f(x) = (x + \sqrt{5})^2(x - 3i)$
C) -5, $-3i$, $3i$; $f(x) = (x + 5)(x + 3i)(x - 3i)$
D) -5, $45i$, $9i$; $f(x) = (x + 5)(x - 45i)(x - 9i)$

Answer Key

Testname: RATIONAL ZEROS

- 1) A
- 2) C
- 3) B
- 4) C
- 5) C
- 6) C