

- x_1 and x_2 are roots of the quadratic equation $x^2 - 2mx + m = 0$ and $x_1 \cdot x_2 + x_1 + x_2 = 6$, then find m .

A) -2 B) -1 C) 0 D) 1 E) 2
- The roots of the quadratic equation $x^2 + bx + c = 0$ are b and c . ($c \neq 0$) Find the discriminant Δ of this equation.

A) 1 B) 3 C) 4 D) 9 E) 16
- The roots of the quadratic equation $x^2 + (n^2 - 1)x + n + 1 = 0$ are x_1 and x_2 . Find $\frac{1}{x_1} + \frac{1}{x_2}$.

A) n^2 B) n C) $n - 1$ D) $1 - n$ E) $n + 1$
- Which one of the followings is true for the quadratic equation $x^2 - (1 - a)x + a^2 + a + 1 = 0$? ($a \neq -1$)

A) It has two different real roots
 B) It has two equal roots
 C) Roots are not real
 D) The product of the roots is negative
 E) One of the roots is 1
- Which one of the followings is false for the equation $x^2 - 7x + 1 = 0$?

A) The roots are not integer
 B) The roots have the same sign
 C) The roots are rational
 D) The roots are both positive
 E) Sum of the roots is positive
- If $2x^2 - mx + 16 = 0$ and $x_1 = x_2^2$, what is the value of m ?

A) 8 B) -8 C) -12 D) 12 E) 10
- Given that $x^2 - 3x + 4 = 0$ and $x_1 > x_2$. Which one of the followings is equal to $x_1\sqrt{x_2} + x_2\sqrt{x_1}$?

A) $\sqrt{7}$ B) $2\sqrt{7}$ C) $3\sqrt{7}$ D) $4\sqrt{7}$ E) $5\sqrt{7}$

- Which one of the followings is the quadratic equation whose roots are 1 and 2?

A) $x^2 + 3x + 2 = 0$ B) $x^2 + 3x - 2 = 0$
 C) $x^2 + 2x + 3 = 0$ D) $x^2 - 2x + 3 = 0$
 E) $x^2 - 3x + 2 = 0$
- Which one of the followings is the quadratic equation whose roots are -2 and 3?

A) $x^2 - x - 6 = 0$ B) $x^2 - 2x + 3 = 0$
 C) $2x^2 - 6x + 1 = 0$ D) $x^2 + x - 6 = 0$
 E) $x^2 + 2x - 6 = 0$
- Which one of the followings is the quadratic equation, whose roots are $\frac{1}{1 - \sqrt{2}}, \frac{1}{1 + \sqrt{2}}$?

A) $x^2 - 2x + 3 = 0$ B) $x^2 + 2x - 1 = 0$
 C) $x^2 - x - 1 = 0$ D) $x^2 + 2x - 2 = 0$
 E) $x^2 + 2x - 3 = 0$
- $2x^3 - 4x^2 + x - 2 = 0 \Rightarrow x_1 + x_2 + x_3 = ?$

A) -2 B) 2 C) -1 D) 1 E) $-\frac{1}{2}$
- If the numbers 1 and -1 are the roots of the equation $x^3 + (m - 3)x - n = 0$, what is the product of all roots?

A) 0 B) 1 C) -1 D) 2 E) -2
- If x_1, x_2 and x_3 are the roots of the equation $x^3 + 3x^2 - 2x + m = 0$, then find $x_1^2 + x_2^2 + x_3^2$.

A) 5 B) 11 C) 13 D) 15 E) 18
- The roots of the equation $x^3 - 4x^2 - x + 4 = 0$ are 1, b and c . Find $b^2 + c^2$.

A) 17 B) 16 C) 15 D) 14 E) 13
- If the roots of the equation $x^3 - 7x^2 + ax - 8 = 0$ are the three consecutive terms of a geometric sequence, then what is a ?

A) -14 B) -7 C) -2 D) 7 E) 14

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16. Find the solution set of $2x - 3 + \sqrt{2x - 3} = 6$.

- A) {6} B) $\{\frac{7}{2}, 6\}$ C) $\{\frac{7}{2}\}$
 D) {-6} E) $\{-6, \frac{7}{2}\}$

17. If $\frac{x-4}{x+2} + \frac{x+2}{x+4} = 0$, find $\sqrt{\Delta - 3}$.

(Δ : discriminant)

- A) 3 B) 4 C) 5 D) 28 E) 53

18. Find the solution set of $\frac{1}{x-2} + \frac{1}{x-8} = \frac{1}{x}$.

- A) {4} B) {-4} C) {-4,4}
 D) {-2,4} E) {-4,-2}

19. Find the sum of the roots of the equation

$$4^x - 3 \cdot 2^x + 2 = 0.$$

- A) $-\frac{3}{2}$ B) -1 C) 0 D) 1 E) 2

20. Which one of the followings is the solution set of

$$\sqrt[4]{x} = \sqrt{x} - 2?$$

- A) {1,4} B) {1,16} C) {16}
 D) {4} E) {1,4,16}

21. Find the solution set of the equation

$$(x^2 + 4x)^2 + x^2 + 4x = 30 \text{ in } \Re.$$

- A) {-1,5} B) {-5,1} C) {-6,5}
 D) {-6,1} E) {-5,-3,-2,1}

22. Which one of the followings is the solution set of

the equation $\frac{x(x^3 + 8)(x^3 - 8)^7}{(x^2 + 2x)^5} = 0$?

- A) {-2,2,0} B) {-2,2} C) {0}
 D) {1,2} E) {2}

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