

Sum and Product of the Roots / Nature of the Roots / Review

- For which equation does the sum of the roots equal 3 and the product of the roots equal 4.5?
(1) $x^2 + 3x - 9 = 0$ (3) $2x^2 + 6x + 9 = 0$
(2) $x^2 - 3x - 9 = 0$ (4) $2x^2 - 6x + 9 = 0$
- For the solution set $\left\{\frac{2}{5} \pm \frac{\sqrt{3}}{5}\right\}$, write a quadratic equation with integer coefficients.
- When the sum of $4 + 6i$ and $6 - 8i$ is graphed, in which quadrant does it lie?
(1) I (3) III
(2) II (4) IV
- The roots of the equation $ax^2 + 4x = -2$ are real, rational, and equal when a has a value of
(1) 1 (3) 3
(2) 2 (4) 4
- In the equation $x^2 - 7x + 2 = 0$, the sum of the roots exceeds the product of the roots by
(1) 9 (3) -9
(2) 5 (4) -5
- Which equation has rational roots?
(1) $x^2 + 8x - 8 = 0$ (3) $2x^2 + 4x + 5 = 0$
(2) $x^2 + 8x + 9 = 0$ (4) $3x^2 + 8x + 4 = 0$
- Impedance measures the opposition of an electrical circuit to the flow of electricity. The total impedance in a particular circuit is given by the formula $Z_T = \frac{Z_1 Z_2}{Z_1 + Z_2}$. What is the total impedance of a circuit, Z_T , if $Z_1 = 1 + 2i$ and $Z_2 = 1 - 2i$?
(1) 0 (3) $\frac{5}{2}$
(2) $-\frac{3}{2}$ (4) 1
- In the equation $ax^2 + bx + c = 0$, a , b , and c are integers. If $\frac{1}{3} - \frac{2}{3}i$ is a root of this equation, find the values of a , b , and c .
- For what positive value of k is the graph of $y = x^2 - 2kx + 16$ tangent to the x -axis?

10. Express the roots of $\frac{x+8}{5} + \frac{x+5}{x} = 1$ in simplest $a + bi$ form.
11. A pendant is suspended from a chain. The relationship between the rate of speed of the pendant, R , the mass of the pendant, M , the length of the chain, L , and the force, F , is $R = 2\sqrt{\frac{ML}{F}}$. Determine the force, F , when $L = 15$, $M = 43$, and $R = 0.4$.
12. Write an equation that has a root of $3 + 4i$.
13. If a quadratic equation with real coefficients has a discriminant of 12, then the two roots must be
(1) real, rational, and equal (3) real, irrational, and unequal
(2) real, rational, and unequal (4) imaginary
14. Which of the following describes the graph of $4x^2 - 3x - 1 = 0$?
(1) The parabola would be tangent to the x -axis.
(2) The parabola would lie entirely above the x -axis.
(3) The parabola would lie entirely below the x -axis.
(4) The parabola would intersect the x -axis at two distinct points.
15. If $2 + 3i$ is one root of a quadratic equation with real coefficients, what is the sum of the roots of the equation?
16. The equation $V = 20\sqrt{C + 273}$ relates the speed of sound, V , in meters per second, to air temperature, C , in degrees Celsius. What is the temperature, in degrees Celsius, when the speed of sound is 320 meters per second?
17. Find all values of k such that the equation $3x^2 - 2x + k = 0$ has imaginary roots.
18. Express the roots of the equation $3x^2 = -2(2x + 3)$ in simplest $a + bi$ form.