

A2.A.2: Using the Discriminant 1: Use the discriminant to determine the nature of the roots of a quadratic equation

- 1 The discriminant of a quadratic equation is 24. The roots are
 - 1) imaginary
 - 2) real, rational, and equal
 - 3) real, rational, and unequal
 - 4) real, irrational, and unequal
- 2 The roots of the equation $9x^2 + 3x - 4 = 0$ are
 - 1) imaginary
 - 2) real, rational, and equal
 - 3) real, rational, and unequal
 - 4) real, irrational, and unequal
- 3 The roots of the equation $x^2 - 10x + 25 = 0$ are
 - 1) imaginary
 - 2) real and irrational
 - 3) real, rational, and equal
 - 4) real, rational, and unequal
- 4 The roots of the equation $x^2 - 3x - 2 = 0$ are
 - 1) real, rational, and equal
 - 2) real, rational, and unequal
 - 3) real, irrational, and unequal
 - 4) imaginary
- 5 The roots of the equation $2x^2 - 8x - 4 = 0$ are
 - 1) imaginary
 - 2) real, rational, and equal
 - 3) real, irrational, and unequal
 - 4) real, rational, and unequal
- 6 The roots of the equation $2x^2 - 5 = 0$ are
 - 1) imaginary
 - 2) real, rational, and equal
 - 3) real, rational, and unequal
 - 4) real and irrational
- 7 The roots of the equation $5x^2 - 2x + 1 = 0$ are
 - 1) real, rational, and unequal
 - 2) real, rational, and equal
 - 3) real, irrational, and unequal
 - 4) imaginary
- 8 The roots of $x^2 - 5x + 1 = 0$ are
 - 1) real, rational, and unequal
 - 2) real, rational, and equal
 - 3) real, irrational, and unequal
 - 4) imaginary
- 9 The roots of the equation $2x^2 + 5x - 6 = 0$ are
 - 1) rational and unequal
 - 2) rational and equal
 - 3) irrational and unequal
 - 4) imaginary
- 10 The roots of the equation $2x^2 - x = 4$ are
 - 1) real and irrational
 - 2) real, rational, and equal
 - 3) real, rational, and unequal
 - 4) imaginary
- 11 The roots of the equation $2x^2 + 4 = 9x$ are
 - 1) real, rational, and equal
 - 2) real, rational, and unequal
 - 3) real, irrational, and unequal
 - 4) imaginary
- 12 The roots of $3x^2 + x = 14$ are
 - 1) imaginary
 - 2) real, rational, and equal
 - 3) real, rational, and unequal
 - 4) real, irrational, and unequal
- 13 The roots of the equation $4(x^2 - 1) = -3x$ are
 - 1) imaginary
 - 2) real, rational, equal
 - 3) real, rational, unequal
 - 4) real, irrational, unequal

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Answer Section

1 ANS: 4 REF: 011323a2

2 ANS: 4

$$b^2 - 4ac = 3^2 - 4(9)(-4) = 9 + 144 = 153$$

REF: 081016a2

3 ANS: 3

$$b^2 - 4ac = (-10)^2 - 4(1)(25) = 100 - 100 = 0$$

REF: 011102a2

4 ANS: 3

$$b^2 - 4ac = (-3)^2 - 4(1)(-2) = 9 + 8 = 17$$

REF: 080106b

5 ANS: 3

$$b^2 - 4ac = (-8)^2 - 4(2)(-4) = 64 + 32 = 96$$

REF: 010513b

6 ANS: 4

$$b^2 - 4ac = 0^2 - 4(2)(-5) = 40$$

REF: 010614b

7 ANS: 4

$$b^2 - 4ac = (-2)^2 - 4(5)(1) = 4 - 20 = -16$$

REF: 080814b

8 ANS: 3

$$b^2 - 4ac = (-5)^2 - 4(1)(1) = 21$$

REF: 060910b

9 ANS: 3

$$b^2 - 4ac = 5^2 - 4(2)(-6) = 73$$

REF: 061010b

10 ANS: 1

$$2x^2 - x - 4 = 0. \quad (-1)^2 - 4(2)(-4) = 1 + 32 = 33$$

REF: 060219b

11 ANS: 2

$$b^2 - 4ac = (-9)^2 - 4(2)(4) = 81 - 32 = 49$$

REF: 011411a2

12 ANS: 3

$$3x^2 + x - 14 = 0 \quad 1^2 - 4(3)(-14) = 1 + 168 = 169 = 13^2$$

REF: 061524a2

13 ANS: 4

$$4x^2 + 3x - 4 = 0 \quad b^2 - 4ac = 3^2 - 4(4)(-4) = 9 + 64 = 73$$

REF: 011618a2