

A2.A.2: Using the Discriminant 4: Use the discriminant to determine the nature of the roots of a quadratic equation

- 1 The roots of a quadratic equation are real, rational, and equal when the discriminant is
 - 1) -2
 - 2) 2
 - 3) 0
 - 4) 4
- 2 Which number is the discriminant of a quadratic equation whose roots are real, unequal, and irrational?
 - 1) 0
 - 2) -5
 - 3) 7
 - 4) 4
- 3 In the equation $ax^2 + 6x - 9 = 0$, imaginary roots will be generated if
 - 1) $-1 < a < 1$
 - 2) $a < 1$, only
 - 3) $a > -1$, only
 - 4) $a < -1$
- 4 The equation $2x^2 + 8x + n = 0$ has imaginary roots when n is equal to
 - 1) 10
 - 2) 8
 - 3) 6
 - 4) 4
- 5 For which positive value of m will the equation $4x^2 + mx + 9 = 0$ have roots that are real, equal, and rational?
 - 1) 12
 - 2) 9
 - 3) 3
 - 4) 4
- 6 For which value of k will the roots of $2x^2 + kx + 1 = 0$ be real?
 - 1) 1
 - 2) 2
 - 3) 3
 - 4) 0
- 7 For which value of c will the roots of the equation $4x^2 - 4x + c = 0$ be real numbers?
 - 1) 1
 - 2) 2
 - 3) 3
 - 4) 4
- 8 Which value of c would make the roots of the equation $x^2 + 6x + c = 0$ real, rational, and equal?
 - 1) 9
 - 2) -9
 - 3) 18
 - 4) -18

- 9 The roots of the equation $2x^2 - 4x + k = 0$ are real and equal if k is equal to
- 2
 - 2
 - 4
 - 4
- 10 The roots of the equation $x^2 + kx + 3 = 0$ are real if the value of k is
- 0
 - 2
 - 3
 - 4
- 11 Which value of c will make the roots of the equation $x^2 - 8x + c = 0$ real and equal?
- 16
 - 4
 - 0
 - 16
- 12 The roots of the equation $ax^2 + 4x = -2$ are real, rational, and equal when a has a value of
- 1
 - 2
 - 3
 - 4
- 13 For which value of k will the roots of the equation $2x^2 - 5x + k = 0$ be real and rational numbers?
- 1
 - 5
 - 0
 - 4
- 14 What is the greatest value of c for which the roots of the equation $x^2 + 4x + c = 0$ are real?
- 15 Use the discriminant to determine all values of k that would result in the equation $x^2 - kx + 4 = 0$ having equal roots.
- 16 Find all values of k such that the equation $3x^2 - 2x + k = 0$ has imaginary roots.
- 17 For what value of k are the roots of $2x^2 - 8x + k = 0$ equal?
- 18 Find the value of k if the roots of the equation $x^2 - 6x + k = 0$ are equal.
- 19 What is one value of k for which $3x^2 - 6x + k = 0$ has real roots?

A2.A.2: Using the Discriminant 4: Use the discriminant to determine the nature of the roots of a quadratic equation

Answer Section

1 ANS: 3 REF: 010201b

2 ANS: 3 REF: 060717b

3 ANS: 4
 $b^2 - 4ac < 0$
 $6^2 - 4(a)(-9) < 0$
 $36 + 36a < 0$
 $36a < -36$
 $a < -1$

REF: 080320b

4 ANS: 1
 $b^2 - 4ac < 0$
 $8^2 - 4(2)(n) < 0$
 $64 - 8n < 0$
 $-8n < -64$
 $n > 8$

REF: 080411b

5 ANS: 1
 $m^2 - 4(4)(9) = 0$
 $m^2 - 144 = 0$
 $(m+12)(m-12) = 0$
 $m = \pm 12$

REF: 080516b

6 ANS: 3 REF: 019031siii
 7 ANS: 1 REF: 089632siii
 8 ANS: 1 REF: 089918siii
 9 ANS: 2 REF: 060032siii
 10 ANS: 4 REF: 080019siii
 11 ANS: 4 REF: 010123siii
 12 ANS: 2

$(4)^2 - 4(a)(2) = 0$
 $ax^2 + 4x + 2 = 0.$ $16 - 8a = 0$
 $a = 2$

REF: 060307b

13 ANS: 3

$$(-5)^2 - 4(2)(0) = 25$$

REF: 061423a2

14 ANS:

4

REF: 080214siii

15 ANS:

$$b^2 - 4ac = 0$$

$$k^2 - 4(1)(4) = 0$$

$$k^2 - 16 = 0$$

$$(k + 4)(k - 4) = 0$$

$$k = \pm 4$$

REF: 061028a2

16 ANS:

$$b^2 - 4ac < 0$$

$$(-2)^2 - 4(3)(k) < 0$$

$$k > \frac{1}{3}.$$

$$4 - 12k < 0$$

$$-12k < -4$$

$$k > \frac{1}{3}$$

REF: 060423b

17 ANS:

8

REF: 018418siii

18 ANS:

9

REF: 068512siii

19 ANS:

$$k \leq 3$$

REF: 019440siii