

A.REI.B.4: Using the Discriminant 4

1 Which equation has imaginary roots?

- 1) $x^2 - 1 = 0$
- 2) $x^2 - 2 = 0$
- 3) $x^2 + x + 1 = 0$
- 4) $x^2 - x - 1 = 0$

2 Which equation has imaginary roots?

- 1) $x^2 - 2x + 1 = 0$
- 2) $x^2 - 2x - 1 = 0$
- 3) $x^2 - 2x + 5 = 0$
- 4) $x^2 - 2x - 5 = 0$

3 Which equation has imaginary roots?

- 1) $x(5+x) = 8$
- 2) $x(5-x) = -3$
- 3) $x(x+6) = -10$
- 4) $(2x+1)(x-3) = 7$

4 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) $a < -1$

5 The equation $2x^2 + 8x + n = 0$ has imaginary roots when n is equal to

- 1) 10
- 2) 8
- 3) 6
- 4) 4

6 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

7 For which value of k will the roots of $2x^2 + kx + 1 = 0$ be real?

- 1) 1
- 2) 2
- 3) 3
- 4) 0

8 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

9 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

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

A.REI.B.4: Using the Discriminant 4 Answer Section

1 ANS: 3

$$1^2 - 4(1)(1) = -3$$

REF: 080211b

2 ANS: 3

REF: 068833siii

3 ANS: 3

$$x^2 + 6x + 10 = 0$$

$$6^2 - 4(1)(10) = -4$$

REF: 060518b

4 ANS: 4

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

$$6^2 - 4(a)(-9) < 0$$

$$36 + 36a < 0$$

$$36a < -36$$

$$a < -1$$

REF: 080320b

5 ANS: 1

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

$$8^2 - 4(2)(n) < 0$$

$$64 - 8n < 0$$

$$-8n < -64$$

$$n > 8$$

REF: 080411b

6 ANS: 1

$$m^2 - 4(4)(9) = 0$$

$$m^2 - 144 = 0$$

$$(m+12)(m-12) = 0$$

$$m = \pm 12$$

REF: 080516b

7 ANS: 3

REF: 019031siii

8 ANS: 1

REF: 089632siii

9 ANS: 1

REF: 089918siii

10 ANS: 2

REF: 060032siii

11 ANS: 4

REF: 080019siii

12 ANS: 4 REF: 010123siii

13 ANS: 2

$$ax^2 + 4x + 2 = 0. \quad (4)^2 - 4(a)(2) = 0$$

$$16 - 8a = 0$$

$$a = 2$$

REF: 060307b

14 ANS: 3

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

REF: 061423a2

15 ANS:

4

REF: 080214siii

16 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

17 ANS:

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

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

$$k > \frac{1}{3}, \quad 4 - 12k < 0$$

$$-12k < -4$$

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

REF: 060423b

18 ANS:

8

REF: 018418siii

19 ANS:

9

REF: 068512siii

20 ANS:
 $k \leq 3$

REF: 019440siii