A.REI.B.4: Using the Discriminant 2

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 $x^2 - 3x - 2 = 0$ are
1) real, rational, and equal
2) real, rational, and unequal
3) real, irrational, and unequal
4) imaginary

3 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

4 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

5 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

6 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

7 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

8 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

9 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

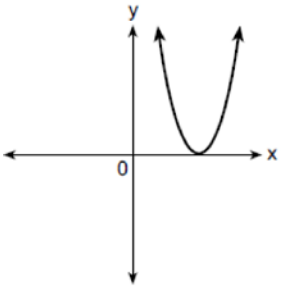
10 The roots of the equation $2x^2 + 4 = 9x$ are
1) real, rational, and equal
2) real, rational, and unequal
3) real, irrational, and unequal
4) imaginary

11 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

12 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

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

14 Which graph shows a quadratic function with two imaginary zeros?

1)


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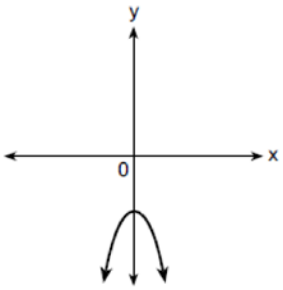

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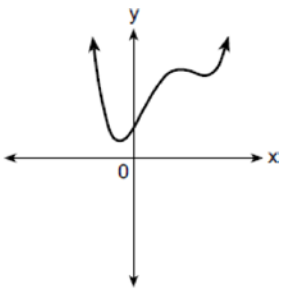

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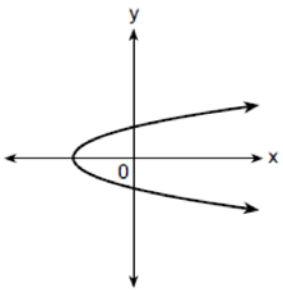
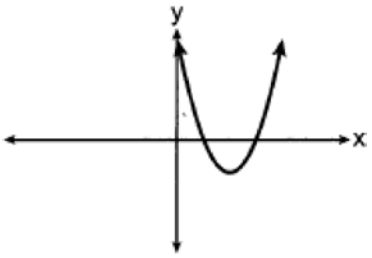


15 Which graph has imaginary roots?

1)


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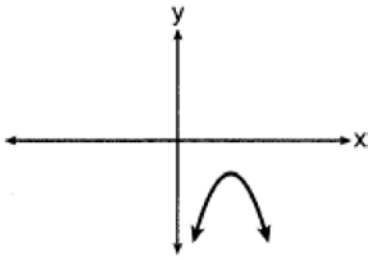

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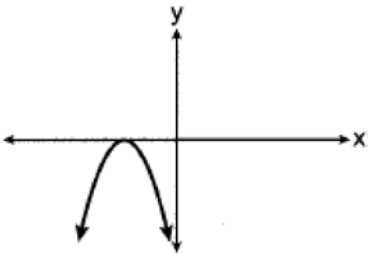
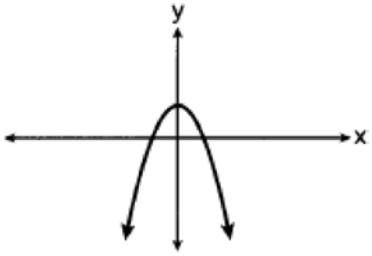
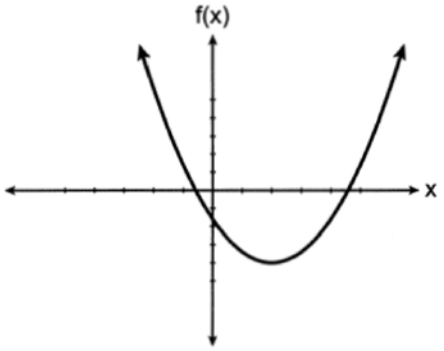


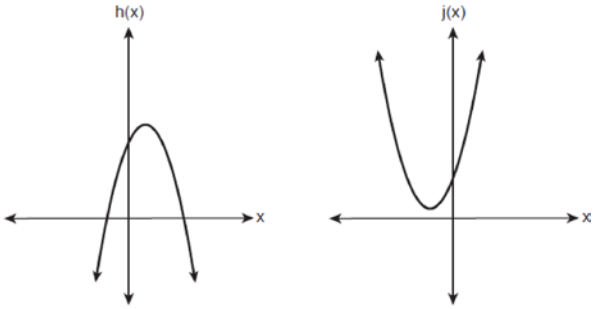
4)


16 If $f(x)$ is represented by the graph below, which translation of $f(x)$ would have imaginary roots?



1) $f(x+5)$
2) $f(x-5)$
3) $f(x)+5$
4) $f(x)-5$

17 In the quadratic formula, b^2-4ac is called the discriminant. The function $f(x)$ has a discriminant value of 8, and $g(x)$ has a discriminant value of -16. The quadratic graphs, $h(x)$ and $j(x)$, are shown below.



Which quadratic functions have imaginary roots?
1) $g(x)$ and $h(x)$
2) $g(x)$ and $j(x)$
3) $f(x)$ and $h(x)$
4) $f(x)$ and $j(x)$

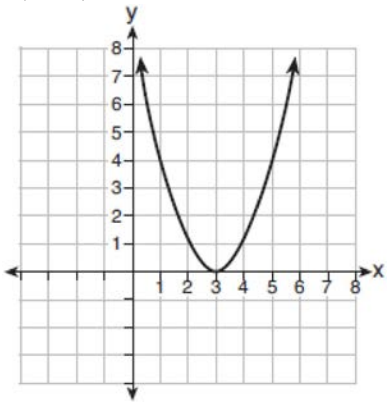
18 Which representation of a quadratic has imaginary roots?

1)

x	y
–2.5	2
–2.0	0
–1.5	–1
–1.0	–1
–0.5	0
0.0	2

2) $2(x+3)^2=64$

3)



4) $2x^2+32=0$

19 Does the equation $x^2-4x+13=0$ have imaginary solutions? Justify your answer.

A.REI.B.4: Using the Discriminant 2
Answer Section

1 ANS: 4 REF: 011323a2

2 ANS: 3

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

REF: 080106b

3 ANS: 3

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

REF: 060910b

4 ANS: 3

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

REF: 011102a2

5 ANS: 4

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

REF: 010614b

6 ANS: 3

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

REF: 010513b

7 ANS: 3

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

REF: 061010b

8 ANS: 4

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

REF: 080814b

9 ANS: 4

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

REF: 081016a2

10 ANS: 2

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

REF: 011411a2

11 ANS: 3

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

REF: 061524a2

12 ANS: 1
$2x^2 - x - 4 = 0$. $(-1)^2 - 4(2)(-4) = 1 + 32 = 33$

REF: 060219b

13 ANS: 4
$4x^2 + 3x - 4 = 0$ $b^2 - 4ac = 3^2 - 4(4)(-4) = 9 + 64 = 73$

REF: 011618a2

14 ANS: 2
1) 1 real, mult. 2; 3) not a quadratic; 4) not a function.

REF: 012324aii

15 ANS: 2 REF: 012402aii

16 ANS: 3 REF: 062409aii

17 ANS: 2 REF: 082308aii

18 ANS: 4
(1) quadratic has two roots and both are real $(-2,0)$ and $(-0.5,0)$, (2) $x = \pm\sqrt{32} - 3$, (3) the real root is 3, with a multiplicity of 2, (4) $x = \pm 4i$

REF: 011909aii

19 ANS:
$b^2 - 4ac = (-4)^2 - 4(1)(13) = 16 - 52 = -36$ imaginary

REF: 062225aii