Math 20-1

ID: A **Name: _____**

Nature of the roots worksheet

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Which equation has two real, irrational solutions?
A. $(x-2)^2 = -1$
B. $(x+5)^2 = 0$
C. $(x+8)^2 = 49$
D. $(x+6)^2 = 43$

2. The coefficients of a quadratic equation are all integers. The discriminant is 0. Which statement best describes its roots?
A. Two irrational roots
B. No real roots
C. One rational root
D. Two rational roots

3. If the discriminant of a quadratic equation is greater than zero, there is/are:
A. 1 real root
B. 2 real roots
C. no solution
D. none of the above

4. Find the value of the discriminant. Then describe the number and type of roots for
$3x^2 - 6x + 2 = 0$

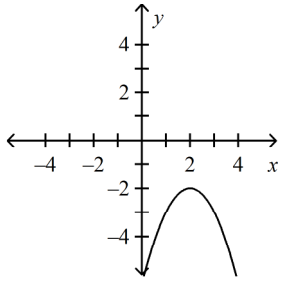
A. Since the discriminant is greater than 0 and is a perfect square, the two roots are real and rational.

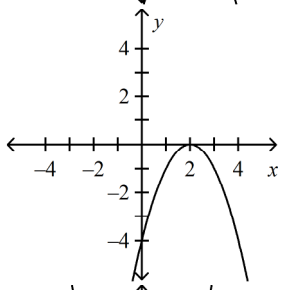
B. Since the discriminant is greater than 0 and is not a perfect square, the roots are real and irrational.

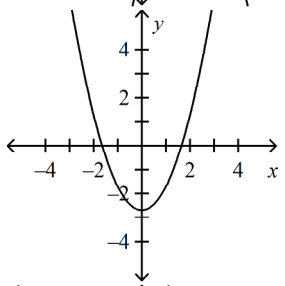
C. Since the discriminant is less than 0, the roots are non-real.

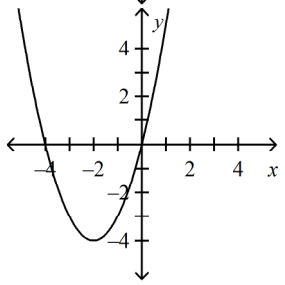
D. Since the discriminant is equal to 0, the roots are equal and real.

5. Which of the following represents a graphical approach to solving a quadratic equation with *two* integral solutions?

A.


B.


C.


D.


Short Answer

6. The quadratic equation $2x^2 + 10x + d = 0$ has only one root. Use the discriminant to determine the value of d.

7. Solve $-11x^2 - 5x - 4 = 0$

8. Solve $-2x^2 + 10x + 11 = 0$

9. Solve $8x^2 - 5x + 3 = 0$

10. Solve $-2x^2 - 7x = 0$

11. The quadratic equation $2x^2 - 4x + d = 0$ has only one root. Use the discriminant to determine the value of d.

12. Solve $x^2 - 4x + 3 = 0$

13. Solve $-10x^2 + 5x + 4 = 0$

14. Determine the discriminant of the equation $10x^2 - 15x - 70 = 0$

15. Solve $3x^2 + 2x - 4 = 0$

16. Solve $x^2 - 11x - 12 = 0$

17. The quadratic equation $2x^2 - 2x + d = 0$ has only one root. Use the discriminant to determine the value of *d*.

18. Determine the nature of the roots of $x^2 - 6x + 9 = 0$

19. Determine the discriminant of the equation $16x^2 - 12x - 18 = 0$

20. Solve $-6x^2 + 11x - 5 = 0$

21. Determine the discriminant of the equation $9x^2 - 29x - 28 = 0$

22. Solve $6x^2 + 7x - 10 = 0$

23. Calculate the value of the discriminant for this equation: $-3x^2 - 6x - 1 = 0$

24. Calculate the value of the discriminant for this equation: $-3x^2 - 6x - 5 = 0$

25. Solve $-10x^2 + 10x - 8 = 0$

Nature of the roots worksheet
Answer Section

MULTIPLE CHOICE

1. D
2. C
3. B
4. B
5. D

SHORT ANSWER

6. $d = 12.5$
7. no real roots since the discriminant is –151
8. $x = \frac{5 \pm \sqrt{47}}{2}$
9. no real roots since the discriminant is –71
10. $x = 0$ or $-\frac{7}{2}$
11. $d = 2$
12. $x = 1$ or 3
13. $x = \frac{5 \pm \sqrt{185}}{20}$
14. 3025
15. $x = \frac{-1 \pm \sqrt{13}}{3}$
16. $x = -1$ or 12
17. $d = 0.5$
18. Two equal real roots
19. 1296
20. $x = 1$ or $\frac{5}{6}$
21. 1849
22. $x = -2$ or $\frac{5}{6}$
23. 24
24. –24
25. no real roots since the discriminant is –220