

Math Sheet

Name _____ Score _____ / 12 Teacher _____ Date _____

Working with the Discriminant

Use $D = b^2 - 4ac$ for the equation after moving every term to the left. Follow the instruction for each section.

1–4 Calculate the discriminant

1. $m^2 = 4m - 31$

2. $b^2 = -4b - 4$

3. $n^2 = 10n - 10$

4. $y^2 = -20y - 19$

5–8 Calculate D and count the distinct real or nonreal complex roots

5. $z^2 = -18z + 40$

6. $a^2 = -2a - 1$

7. $c^2 = 22c - 23$

8. $s^2 = -7s - 26$

9–12 Calculate D and classify the distinct roots

9. $x^2 = 30x - 11$

10. $r^2 = 8r - 16$

11. $p^2 = -4p + 32$

12. $q^2 = 11q - 32$

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Working with the Discriminant

Answer Key

Use $D = b^2 - 4ac$ for the equation after moving every term to the left. Follow the instruction for each section.

1–4 Calculate the discriminant

1. $m^2 = 4m - 31$

$a = 1, b = -4, c = 31; D = b^2 - 4ac = (-4)^2 - 4(1)(31) = -108$

2. $b^2 = -4b - 4$

$a = 1, b = 4, c = 4; D = b^2 - 4ac = (4)^2 - 4(1)(4) = 0$

3. $n^2 = 10n - 10$

$a = 1, b = -10, c = 10; D = b^2 - 4ac = (-10)^2 - 4(1)(10) = 60$

4. $y^2 = -20y - 19$

$a = 1, b = 20, c = 19; D = b^2 - 4ac = (20)^2 - 4(1)(19) = 324$

5–8 Calculate D and count the distinct real or nonreal complex roots

5. $z^2 = -18z + 40$

$a = 1, b = 18, c = -40; D = b^2 - 4ac = (18)^2 - 4(1)(-40) = 484$

2 distinct real roots

6. $a^2 = -2a - 1$

$a = 1, b = 2, c = 1; D = b^2 - 4ac = (2)^2 - 4(1)(1) = 0$

1 distinct real root (repeated)

7. $c^2 = 22c - 23$

$a = 1, b = -22, c = 23; D = b^2 - 4ac = (-22)^2 - 4(1)(23) = 392$

2 distinct real roots

8. $s^2 = -7s - 26$

$a = 1, b = 7, c = 26; D = b^2 - 4ac = (7)^2 - 4(1)(26) = -55$

2 distinct nonreal complex roots

9–12 Calculate D and classify the distinct roots

9. $x^2 = 30x - 11$

$a = 1, b = -30, c = 11; D = b^2 - 4ac = (-30)^2 - 4(1)(11) = 856$

2 distinct irrational real roots

10. $r^2 = 8r - 16$

$a = 1, b = -8, c = 16; D = b^2 - 4ac = (-8)^2 - 4(1)(16) = 0$

1 distinct rational root (repeated)

11. $p^2 = -4p + 32$

$a = 1, b = 4, c = -32; D = b^2 - 4ac = (4)^2 - 4(1)(-32) = 144$

2 distinct rational roots

12. $q^2 = 11q - 32$

$a = 1, b = -11, c = 32; D = b^2 - 4ac = (-11)^2 - 4(1)(32) = -7$

2 distinct nonreal complex roots