Name:

Date:

School:

Facilitator:

**6.03 The Discriminant of the Quadratic Formula**

**Using each of the following quadratic equations, determine the value of the discriminant as well as the number and type of solutions. You should also state the number of *x*-intercepts.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1. | 9*x*2 – 3*x* + 2 = 0 | Value of the Discriminant: |  | Number of Real Solutions: |  |
|  |  | Number of *x*-intercepts: |  | Type of Solutions: |  |
|  | **Show work here:** | | |  |  |
|  |  | | |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 2. | -*x*2 – 6*x* – 9 = 0 | Value of the Discriminant: |  | Number of Real Solutions: |  |
|  |  | Number of *x*-intercepts: |  | Type of Solutions: |  |
|  | **Show work here:** | | |  |  |
|  |  | | |  |  |

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| --- | --- | --- | --- | --- | --- |
| 3. | -6*x*2 + 7*x* + 3 = 0 | Value of the Discriminant: |  | Number of Real Solutions: |  |
|  |  | Number of *x*-intercepts: |  | Type of Solutions: |  |
|  | **Show work here:** | | |  |  |
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| --- | --- | --- | --- | --- | --- |
| 4. | 2*x*2 + 5*x* – 4 = 0 | Value of the Discriminant: |  | Number of Real Solutions: |  |
|  |  | Number of *x*-intercepts: |  | Type of Solutions: |  |
|  | **Show work here:** | | |  |  |
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| --- | --- | --- | --- | --- | --- |
| 5. | 4*x*2 – 8*x* + 4 = 0 | Value of the Discriminant: |  | Number of Real Solutions: |  |
|  |  | Number of *x*-intercepts: |  | Type of Solutions: |  |
|  | **Show work here:** | | |  |  |
|  |  | | |  |  |

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| --- | --- | --- | --- | --- | --- |
| 6. | -3*x*2 + 17*x* – 5 = 0 | Value of the Discriminant: |  | Number of Real Solutions: |  |
|  |  | Number of *x*-intercepts: |  | Type of Solutions: |  |
|  | **Show work here:** | | |  |  |
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| --- | --- | --- | --- | --- | --- |
| 7. | -4*x*2 – 4*x* + 5 = 0 | Value of the Discriminant: |  | Number of Real Solutions: |  |
|  |  | Number of *x*-intercepts: |  | Type of Solutions: |  |
|  | **Show work here:** | | |  |  |
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| --- | --- | --- | --- | --- | --- |
| 8. | 9*x*2 + 24*x* + 16 = 0 | Value of the Discriminant: |  | Number of Real Solutions: |  |
|  |  | Number of *x*-intercepts: |  | Type of Solutions: |  |
|  | **Show work here:** | | |  |  |
|  |  | | |  |  |

**Using what you have learned in this lesson, create your own quadratic equation given each condition. You may not use any of the equations from this worksheet or from the lesson. You must create your own coefficients. Be sure to check your answer as well as fill-in your signs.**

|  |  |  |
| --- | --- | --- |
| 9. | Quadratic equation with two real solutions | *x*2 *x*  = 0 |
|  |  |  |
| 10. | Quadratic equation with no real solutions | *x*2 *x*  = 0 |
|  |  |  |
| 11. | Quadratic equation with one real solution | *x*2 *x*  = 0 |
|  |  |  |

**Using the given quadratic function, determine the value of the discriminant as well as the number and type of solutions. Then, verify your solutions with the quadratic formula.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 12. | *f*(*x*) = -3*x*2 + 4*x* – 5 | | Value of the discriminant: | | |  |  |
|  |  | | Number and Type of Real Solutions: | | |  |  |
|  | **Find the value of the discriminant here:** | | | | |  |  |
|  | = *b*2 – 4*ca* | | | |  |  |  |
|  | = ()2 – 4()() | | | |  |  |  |
|  | = | | | |  |  |  |
|  | = | | | |  |  |  |
|  |  |  |  | |  |  |  |
|  | **Substitute into the Quadratic Formula:** | | | |  |  |  |
|  |  | | | | | **Note:** If the entire quadratic formula is not needed (if you have the square root of a negative number), you do not have to fill-in all parts. | |
|  |  | | | | |
|  |  | | |  | |
|  | *x* = | | | *x* = | |  |  |
|  |  | | | |  |  |  |
|  | Was your prediction of your number and type of solutions correct? | | | | |  | (Yes or No) |
|  |  |  |  | |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 13. | *f*(*x*) = 4*x*2 – 7*x* + 2 | | Value of the discriminant: | | |  |  |
|  |  | | Number and Type of Real Solutions: | | |  |  |
|  | **Find the value of the discriminant here:** | | | | |  |  |
|  | = *b*2 – 4*ac* | | | |  |  |  |
|  | = ()2 – 4()() | | | |  |  |  |
|  | = | | | |  |  |  |
|  | = | | | |  |  |  |
|  |  |  |  | |  |  |  |
|  | **Substitute into the Quadratic Formula:** | | | |  |  |  |
|  |  | | | | | **Note:** If the entire quadratic formula is not needed (if you have the square root of a negative number), you do not have to fill-in all parts. | |
|  |  | | | | |
|  |  | | |  | |
|  | *x* = | | | *x* = | |  |  |
|  |  | | | |  |  |  |
|  | Was your prediction of your number and type of solutions correct? | | | | |  | (Yes or No) |
|  |  |  |  | |  |  |  |