Name _____ Date _____ Period _____

DIRECTIONS: For #1-4, use the following equation to answer the questions.

$$y + 5 = 4(x - 2)^2$$

1. What is the **vertex**? _____
2. What is the **axis of symmetry**? _____
3. Does the parabola open UP or DOWN? _____
4. Is the shape, NARROWER, WIDER, or the SAME WIDTH as $y = x^2$? _____

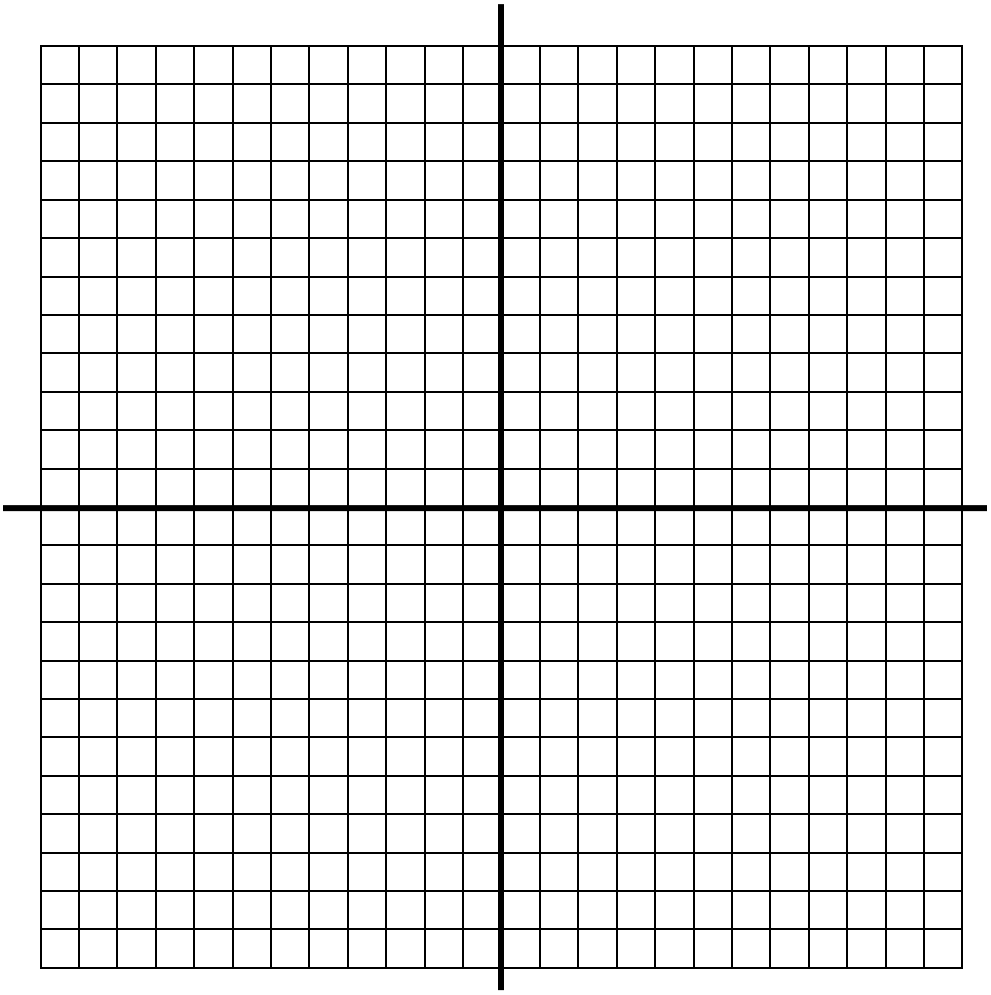
DIRECTIONS: For #5-9, use the following equation to answer the questions.

$$y - 3 = -\frac{1}{2}(x + 1)^2$$

5. What is the maximum/minimum **value**? _____
6. Is this value a MAXIMUM or a MINIMUM? _____
7. What is the **domain**? _____
8. What is the **range**? _____
9. What are the **zeros**? _____

DIRECTIONS: For #10, graph the given equation. Be sure to include the axis of symmetry and as many points as possible.

10. $y - 8 = -2(x + 2)^2$



DIRECTIONS: For #11-14, write the functions in **vertex form**→ $y - k = a(x - h)^2$

11. $f(x) = x^2 - 6x + 16$ _____

12. $f(x) = -4(x - 5)^2 - 3$ _____

13. $g(x) = 2x^2 + 10x + 17$ _____

14. $h(x) = 20x - 5x^2$ _____

DIRECTIONS: For #15-21, use the following function to answer the questions.

$$f(x) = 5 - 6x - x^2$$

15. What is this function in **vertex form**? _____

16. What is the **vertex**? _____

17. What is the **axis of symmetry**? _____

18. What is the maximum/minimum **value**? _____

19. Is this value a MAXIMUM or a MINIMUM? _____

20. What is the **range**? _____

21. What are the **zeros**? _____

DIRECTIONS: For #22-23, descriptions of parabolas are provided. Write equations for each in **vertex form**→ $y - k = a(x - h)^2$

22. Vertex $(3, -9)$ and contains the point $(-1,\ 55)$ _____

23. Vertex $(-6, -7)$ and y-intercept is -61 _____

DIRECTIONS: For #24-26, write quadratic equations ($ax^2 + bx + c = 0$) with integer coefficients for the given roots.

24. Roots are -5 and 3 _____

25. Roots are $7 + i$ and $7 - i$ _____

26. Roots are $\frac{3+\sqrt{5}}{4}$ and $\frac{3-\sqrt{5}}{4}$ _____

DIRECTIONS: For #27, a description of a parabola is provided. Write a quadratic function → $f(x) = ax^2 + bx + c$

27. Minimum value of -8; x-intercepts are 1 and 5 _____

DIRECTIONS: For #28, solve and show work (to prove your answer is correct). Write your answer in the provided blank.

28. A rectangular plot is to be enclosed on three sides with 200 meters of fencing. The fourth side is up against a barn and does not require a fence. Find the maximum area that can be enclosed.

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