**Algebra I Final Review** **Name:** _____

## Unit 3 Quadratics

**Factor the trinomial**

1. $x^2 + 2x - 8$

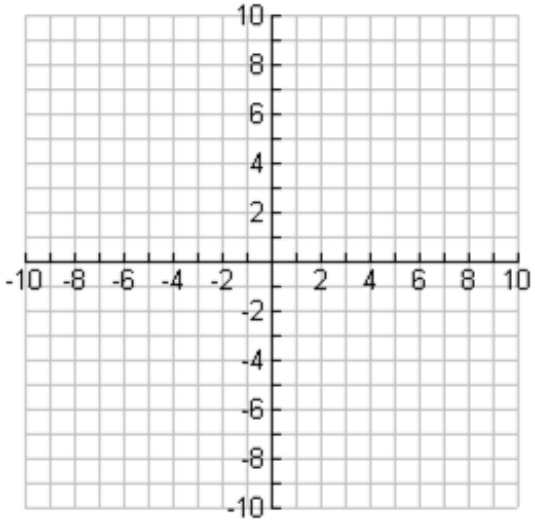
2. $x^2 - 81$

3. $y = 4x^2 + 10x + 6$

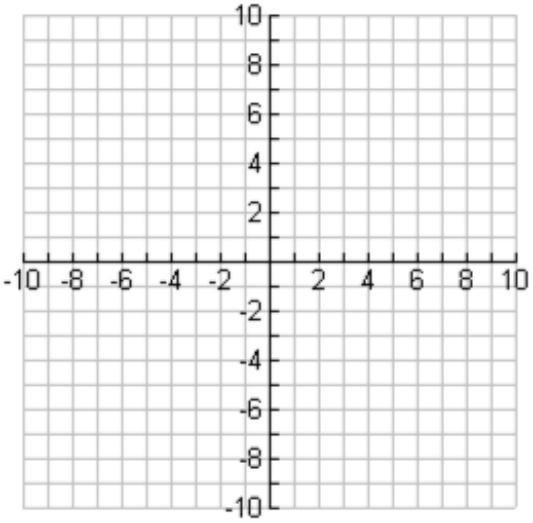
4. $6x^2 - 13x + 5$

**Graph the quadratic.**

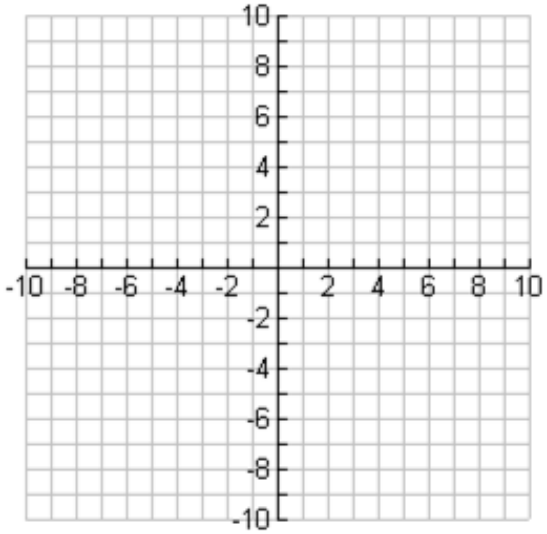
5. $-3x^2 + x + 1$




6. $y = 3(x - 4)^2 + 1$




7. Graph the parent function: $y = x^2$ then graph function 2: $y = \frac{1}{2}x^2 + 7$




8. Describe the transformations that occurred.

| **Write the quadratic.** | |
|---|---|
| 9. Write the function that represents the parent function, $y = x^2$, after it has been translated reflected across the x-axis, shifted 7 up and 2 left. | 10. Write the function that represents the parent function, $y = x^2$, after it has been vertically stretched and shifted down 3. |
| **Describe the transformations.** | |
| 11. $y = -5x^2$ | 12. $x^2 - 7$ |
| 13. $y = \frac{1}{5}(x-4)^2$ | 14. $y = (x+5)^2 + 1$ |
| **Find the vertex.** | |
| 15. $y = -x^2 + 8x + 12$ | 16. $y = 2(x+3)^2 - 9$ |
| **Convert from standard form to vertex form.** | |
| 17. $x^2 + 4x - 7$ | 18. $3x^2 + 6x - 1$ |
| **Convert to standard form.** | |
| 19. $y = 2(x+1)^2 + 3$ | 20. $y = (3x+2)(x-3)$ |

## Unit 4 Sequences

21. Using the formula for the geometric sequence, $a_n = 3(-2)^{n-1}$ what is the fifth term?

22. Write the explicit formula for the arithmetic sequence: 4, 1, -2, -5…

## Unit 5 Describing Functions

23. Find the rate of change between [1,3]

| x | g(x) |
|---|---|
| -7 | 2 |
| -5 | 3 |
| -3 | 4 |
| -1 | 5 |

24. Find the rate of change between [1,3]
f(x) = 3x + 5

25. Which has a higher rate of change?

26. Which has a larger y-intercept?

27. Decide whether the change in temperature is linear or exponential.

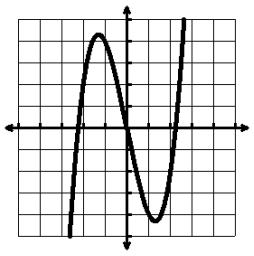
| Time (Hours) | Method 1 Temperature (°F) |
|---|---|
| 0 | 0 |
| 1 | 5 |
| 2 | 11 |
| 3 | 15 |
| 4 | 19 |
| 5 | 25 |

28. Decide whether the change in temperature is linear or exponential.

| Time (Hours) | Method 2 Temperature (°F) |
|---|---|
| 0 | 1.5 |
| 1 | 3 |
| 2 | 6 |
| 3 | 12 |
| 4 | 24 |
| 5 | 48 |

**Decide whether each function is linear, exponential, quadratic, or neither.**

29.



30.

| x | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|
| y | 0 | 5 | 8 | 9 | 8 | 5 | 0 |

31. $y = \frac{2}{5}x^3 - 14$

32. $y = 4x - 8$

33. $y - 6 = 2(x + 6)$

34. $f(x) = -x^3 - 2x + 5$

## Unit 6 Describing Data

| State | Area (thousands of square miles) |
|---|---|
| Connecticut | 6 |
| Georgia | 59 |
| Maryland | 12 |
| Massachusetts | 11 |
| New Hampshire | 9 |
| New York | 54 |
| North Carolina | 54 |
| Pennsylvania | 46 |

35. Find the mean.

36. Find the median.

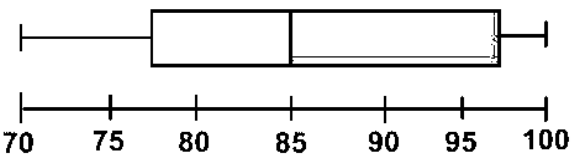
37. Find the range.

38. Find the interquartile range.

40 How would adding 2 to the data set affect the measure of center and range?

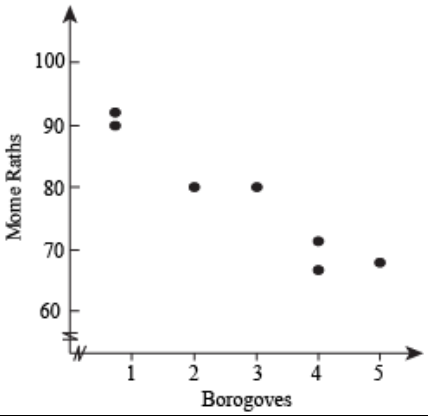
41. Find the mean, median, and IQR.
25, 23, 17, 15, 19, 21, 28, 30, 26, 28

42. label the minimum, maximum, first quartile median, and third quartile. Then find the interquartile range.



43. The events x and y have a correlation coefficient of $r = -0.17$, what is the relationship between x and y?

44. Estimate the correlation coefficient.




A book club has 200 members. Each member was asked whether he or she prefers fiction or nonfiction books. The results are shown in the table below.

| Age | Fiction | Nonfiction | Total |
|---|---|---|---|
| 21-30 | 64 | 22 | 86 |
| 31-40 | 76 | 38 | 114 |
| Total | 140 | 60 | 200 |

45. What is the marginal frequency of club members who prefer fiction?

46. What is the joint frequency of club members between the Age 21-30 who prefer nonfiction?

47. What is the percentage of students who prefer fiction?

48. What is the percentage of students who prefer nonfiction?

Use the table below the answer questions 49-51

| x | y |
|---|---|
| 1 | 6 |
| 2 | 12 |
| 3 | 15 |
| 4 | 24 |
| 5 | 28 |
| 6 | 32 |
| 7 | 35 |

49. What is the best fitting linear line for the data below? Record the correlation coefficient.

50. Write the exponential line of best fit. Record the correlation coefficient.

51. Which model would best represent the data? Why?