Chapter 4 Study Guide (4.1-4.6)

NOT HOMEWORK Name: Key Date: _____ Period: _____

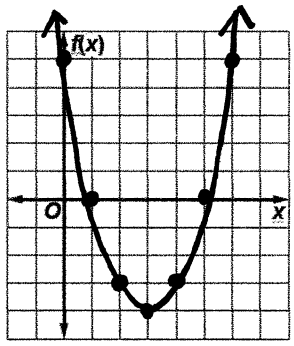
Complete all parts for each quadratic function.

a) Find the y-intercept, the axis of symmetry, and the vertex.
b) Make a table and graph the parabola
c) Determine whether each function has a maximum or a minimum value, and find it
d) Find the roots. If exact roots cannot be found, state the numbers between which the roots are located

1. $f(x) = x^2 - 6x + 5$

yint: 5
axis: 3
vertex: (3,-4)
MIN at -4
roots: x=1, x=5

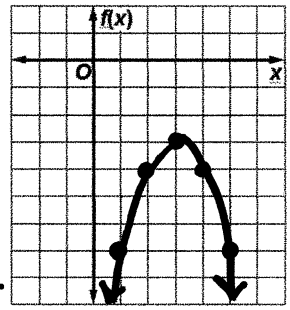
x	y
0	5
1	0
2	-3
3	-4
4	-3
5	0
6	5



2. $f(x) = -x^2 + 2x - 4$

yint: -4
axis: 1
vertex: (1,-3)
MAX at -3
roots: none

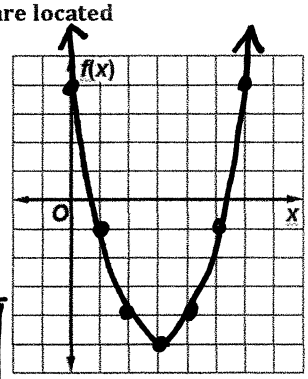
x	y
-2	-12
-1	-7
0	-4
1	-3
2	-4
3	-7
4	-12



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

yint: 4
axis: 3
vertex: (3,-5)
MIN at -5
roots: x is between 0 and 1, x is between 5 and 6

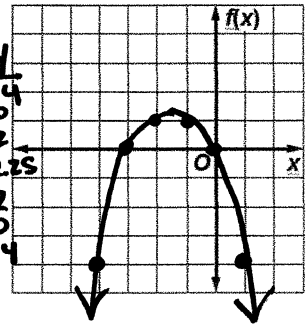
x	y
0	4
1	-1
2	-4
3	-5
4	-4
5	-1
6	4



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

yint: 0
axis: -1.5
vertex: (-1.5, 2.25)
MAX at 2.25
roots: x=-3, x=0

x	y
-4	-4
-3	0
-2	2
-1.5	2.25
-1	2
0	0
1	-4
2	



Solve each equation by factoring.

5. $x^2 - 9 = 0$ Difference x=3, x=-3

6. $x^2 - 10x + 25 = 0$ a=1 x=5

7. $3x^2 + 9x = 0$ GCF x=0, x=-3

8. $8x^2 - 64x = 0$ GCF x=0, x=8

9. $x^2 - 3x + 2 = 0$ a=1 x=2, x=1

10. $50x^2 + 100x = 0$ GCF x=0, x=-2

11. $6x^2 - 5x + 1 = 0$ a≠1 x=1/3, x=1/2

12. $4x^2 - 4x - 3 = 0$ a≠1 x=3/2, x=-1/2

13. $x^2 - 64 = 0$ difference x=8, x=-8

14. $x^2 - 6x + 5 = 0$ a=1 x=5, x=1

15. $x^2 - 6x + 9 = 0$ a=1 x=3

16. $x^2 - 4x - 21 = 0$ a=1 x=7, x=-3

17. $4x^2 + 5x - 6 = 0$ a≠1 x=-2, x=3/4

18. $25x^2 - 81 = 0$ difference x=-9/5, x=9/5

19. $2x^2 + 5x - 3 = 0$ a≠1 x=-3, x=1/2

Simplify the following.

20. $\sqrt{-96}$ $\pm 4i\sqrt{6}$

21. $\sqrt{36}$ ± 6

22. $\sqrt{72}$ $\pm 6\sqrt{2}$

23. $\sqrt{-45}$ $\pm 3i\sqrt{5}$

24. $\sqrt{-18}$ $\pm 3i\sqrt{2}$

25. $\sqrt{-14}$ $\pm i\sqrt{14}$

26. $\sqrt{54}$ $\pm 3\sqrt{6}$

27. $\sqrt{-121}$ $\pm 11i$

28. $\sqrt{-1}$ $\pm i$

29. $\sqrt{-8}$ $\pm 2i\sqrt{2}$

30. $\sqrt{-16}$ $\pm 4i$

31. $\sqrt{2}$ $\pm\sqrt{2}$

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Solve each equation by using the Square Root Property.

32. $2x^2 = 32$

$x = \pm 4$

33. $2x^2 + 8 = 0$

$x = \pm 2i$

34. $x^2 + 36 = 0$

$x = \pm 6i$

35. $x^2 - 4 = -3$

$x = \pm 1$

36. $5x^2 + 5 = 0$

$x = \pm 1i$

37. $x^2 - 9 = 3$

$x = \pm 2\sqrt{3}$

38. $x^2 - 8x + 16 = 1$

$x = 5 \quad x = 3$

39. $x^2 + 4x + 4 = -1$

$x = -2 \pm i$

40. $x^2 + 12x + 36 = -25$

$x = -6 \pm 5i$

41. $x^2 + 4x + 4 = 2$

$x = -2 \pm \sqrt{2}$

42. $x^2 - 2x + 1 = 5$

$x = 1 \pm \sqrt{5}$

43. $x^2 - 6x + 9 = -7$

$x = 3 \pm i\sqrt{7}$

Find the value of c that makes each trinomial a perfect square. Then write the trinomial as a perfect square.

32. $x^2 + 10x + c$ $c = 25$ $(x+5)^2$

33. $x^2 - 14x + c$ $c = 49$ $(x-7)^2$

34. $x^2 + 24x + c$ $c = 144$ $(x+12)^2$

35. $x^2 + 5x + c$ $c = \frac{25}{4}$ $(x+\frac{5}{2})^2$

36. $x^2 - 9x + c$ $c = \frac{81}{4}$ $(x-\frac{9}{2})^2$

37. $x^2 - x + c$ $c = \frac{1}{4}$ $(x-\frac{1}{2})^2$

Solve each equation by Completing the Square.

38. $x^2 + 2x - 8 = 0$

$x = 2 \quad x = -4$

39. $x^2 - 4x + 9 = 0$

$x = 2 \pm i\sqrt{5}$

40. $x^2 + 4x + 6 = 0$

$x = -2 \pm i\sqrt{2}$

41. $x^2 + 8x + 10 = 0$

$x = -4 \pm \sqrt{6}$

42. $x^2 - 4x + 12 = 0$

$x = 2 \pm 2i\sqrt{2}$

43. $x^2 + 2x - 12 = 0$

$x = -1 \pm \sqrt{13}$

44. $x^2 + 6x + 8 = 0$

$x = -2 \quad x = -4$

45. $x^2 - 4x + 3 = 0$

$x = 3 \quad x = 1$

Solve each equation using the Quadratic Formula.

46. $x^2 + 10x = -24$

$x = -4 \quad x = -6$

47. $3x^2 - 16x + 16 = 0$

$x = 4 \quad x = 4/3$

48. $x^2 - 10x - 50 = 0$

$x = 5 \pm 5\sqrt{3}$

49. $x^2 - 6x + 21 = 0$

$x = 3 \pm 2i\sqrt{3}$

50. $2x^2 - x - 15 = 0$

$x = 3 \quad x = -5/2$

51. $x^2 - 11x + 20 = -4$

$x = 8 \quad x = 3$

52. $4x^2 - 12x - 63 = 0$

$x = \frac{3 \pm 6\sqrt{2}}{2}$

53. $2x^2 + x - 10 = 5$

$x = -3$

$x = 5/2$