Algebra 2CP
Chapter 5 YOU CAN (Graphing)

✤ Use $y = ax^2 + bx + c$ to find the vertex, axis of symmetry, and direction of opening.

1. $f(x) = -2x^2 + 12x - 9$
2. $f(x) = -3x^2 - 6x - 2$
3. $f(x) = -x^2 + 4x - 12$

✤ Use $y = ax^2 + bx + c$ to make a table of values (three ordered pairs) that includes the vertex. Then graph.

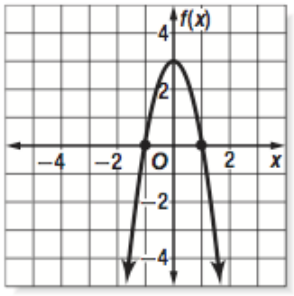
4. $f(x) = -2x^2 + 12x - 9$
5. $f(x) = -3x^2 - 6x - 2$
6. $f(x) = -x^2 + 4x - 12$

✤ Determine whether each function has a maximum or a minimum value and find the maximum or minimum value. Then state the domain and range of the function.

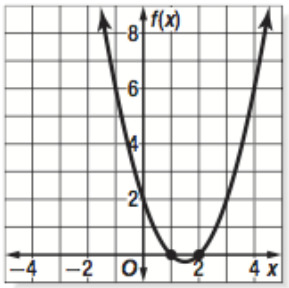
7. $f(x) = x^2 + 6x + 20$
8. $f(x) = x^2 - 8x - 7$
9. $f(x) = -2x^2 + 12x - 9$

✤ Use the related graph of each equation to determine its solutions.

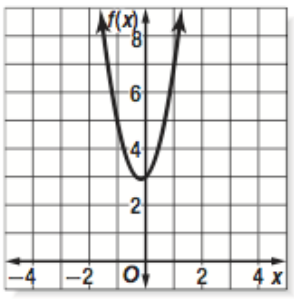
10. $-3x^2 + 3 = 0$



11. $x^2 - 3x + 2 = 0$



12. $3x^2 + x + 3 = 0$



✤ Use $y = a(x-h)^2 + k$ to find the vertex, axis of symmetry, and direction of opening.

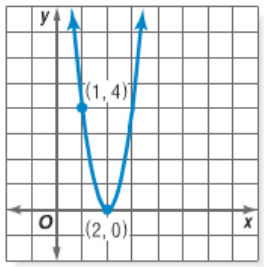
13. $f(x) = \frac{1}{5}(x+3)^2 - 3$
14. $f(x) = -\frac{1}{2}(x-2)^2 - 6$
15. $f(x) = 4(x+5)^2 + 1$

✤ Use $y = a(x-h)^2 + k$ to make a table of values (three ordered pairs) that includes the vertex. Then graph.

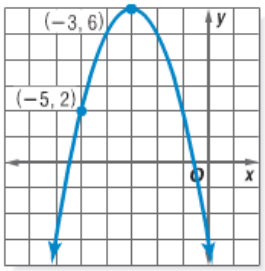
16. $f(x) = \frac{1}{5}(x+3)^2 - 3$
17. $f(x) = -\frac{1}{2}(x-2)^2 - 6$
18. $f(x) = 4(x+5)^2 + 1$

✤ Write an equation in vertex form for the parabola shown in each graph.

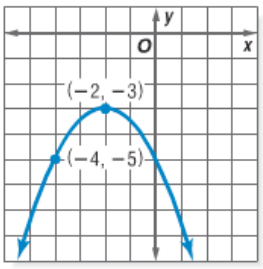
19.



20.



21.



22. A tennis ball is hit upward with a velocity of 48 feet per second. Ignoring the height of the tennis player, how long does it take for the ball to fall to the ground. Use the formula $h(t) = v_0t - 16t^2$ where $h(t)$ is the height of an object in feet, v_0 is the object's initial velocity in feet per second, and t is time in seconds.

Algebra 2CP
Chapter 5 YOU CAN (Algebraic Methods)

YOU CAN without a calculator...

✤ Solve a quadratic equation by factoring.

1. $x^2 - 4x - 32 = 0$
2. $3x^2 + 6x + 3 = 0$
3. $2x^2 + 18x - 44 = 0$
4. $4x^2 = -3x$
5. $4x^2 - 17x = -4$
6. $6x^2 + 6 = -13x$

✤ Solve a quadratic equation by using the square root property.

7. $x^2 + 14x + 49 = 9$
8. $x^2 - 12x + 36 = 25$
9. $x^2 + 16x + 64 = 7$

✤ Solve a quadratic equation by completing the square.

10. $-2x^2 + 12x - 9 = 0$
11. $-3x^2 - 6x = 2$

✤ Solve a quadratic equation using the quadratic formula.

12. $2x^2 + 25x + 33 = 0$
13. $-2x^2 + 12x - 5 = 0$

✤ Solve a quadratic equation by choosing the best method.

14. $5x^2 - 80 = 0$
15. $7x^2 = 35$
16. $3x^2 + 7x - 2 = 0$

✤ Find the value of the discriminant and interpret what it means.

17. $9x^2 - 12x + 4 = 0$
18. $2x^2 - 16x + 33 = 0$
19. $-5x^2 + 8x - 1 = 0$

20. To avoid hitting any rocks below, a cliff diver jumps up and out. The equation $h = -16t^2 + 4t + 26$ describes her height h in feet t seconds after jumping. Find the time at which she returns to a height of 26 feet.

21. The area A in square feet of a projected picture on a movie screen is given by $A = 0.16d^2$, where d is the distance from the projector to the screen in feet. At what distance will the projected picture have an area of 10 square feet?

22. Antoinette has a rectangular garden with the length 8 feet longer than the width. If the area of her rose garden is 128 square feet, find the dimensions of the garden.

5.4 Complex Numbers (Day One)

Product and Quotient Properties of Square Roots
For nonnegative real numbers *a* and *b*,

Example 1: Square Roots

a) $\sqrt{45}$

b) $\sqrt{\frac{32}{81}}$

c) $\sqrt{-27}$

d) $\sqrt{-216y^4}$

Example 2: Operations with Complex Numbers

REMEMBER...
$i^0 =$
$i^1 =$
$i^2 =$
$i^3 =$

a) $3i \cdot 4i$

b) $\sqrt{-20} \cdot \sqrt{-12}$

c) i^{31}

d) i^{29}

e) i^{80}

f) $(-2+5i)+(1-7i)$

g) $(4+6i)-(-1+2i)$

h) $(3-5i)(4+6i)$

i) $(1+2i)(-1+4i)$

j) $\frac{-2i}{3+5i}$

k) $\frac{2+i}{1-i}$

Example 3: Equate Complex Numbers
Find the values of x and y that make the equation true.

a) $5x+1+(3+2y)i = 2x-2+(y-6)i$

b) $(2x-5)+(-y-2)i = 3-7i$

5.4 Complex Numbers (Day Two)

Square Root Property
For any real number *n*, if...

Example 1: Using the Square Root Property

a) $4x^2 + 100 = 0$

b) $5x^2 + 20 = 0$

Example 2: Completing the Square

a) $x^2 + 2x + 2 = 0$

b) $x^2 - 6x + 25 = 0$

Example 3: Discriminant and Quadratic Formula
Find the discriminant, describe the number and type of roots, and find the exact solutions by using the Quadratic Formula.

a) $3x^2 + 5x + 4 = 0$

b) $x^2 + 13 = 6x$