Simplify the following expressions.

$(3-2i)(4+5i)$	$\left(2\sqrt{-6}\right)\left(-6\sqrt{-18}\right)$	$\frac{3+i}{4-2i}$
$\sqrt{-90}$	$(4+i)-(2+i)$	$\frac{4}{i+2}$

Find the values of x and y that make the equation true.

$2x+4yi=12-16i$	$2x-(3+i)=4+2yi$

Find the zeros of the following functions:

13. $f(x) = 5x^2 - 20x + 20$

14. $y = 5x^2 + 16x + 3$

Solve the following equations for x using radicals.

15. $3x^2 + 5 = 20$

16. $4(x+5)^2 - 10 = 6$

17. $-3x^2 + 7 = 34$

Solve the following equations by completing the square.

18. $-2x^2 - 5 = -x$

19. $x^2 - 8x = -14$

Solve the following by using the Quadratic Formula.

20. $x^2 - \frac{3}{5}x = \frac{-2}{25}$

21. $3x^2 + 5x = 2$

Write the following quadratic functions in Vertex Form. State the vertex and intercepts.

22. $y = -x^2 - 4x + 15$

23. $y = \frac{1}{3}x^2 - 4x + 15$

Describe the nature of the roots of each quadratic equation.

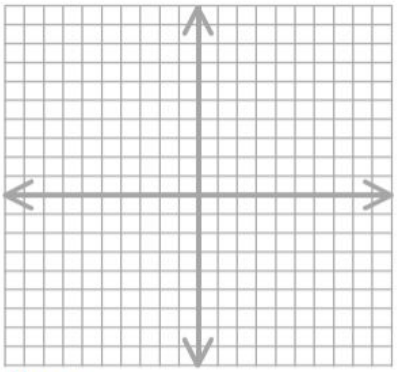
25. $0 = -x^2 + 6x - 9$

26. $0 = -2x^2 + 3x - 2$

27. Describe the **nature of the roots** if a parabola has a discriminant of -49.	28. How many **x-intercepts** will a parabola have if its vertex is in quadrant 3 and the value of "a" is -2.	29. A parabola whose vertex is in quadrant 1 has a discriminant of 23. Describe the **x-intercepts**.
30. A quadratic function has only one x-intercept and a y-intercept (0,-3). Describe the value of "a."	31. The graph of a quadratic function has 2 rational roots. What can you conclude about the **value** of the discriminant?	32. The discriminant of a quadratic equation is 0. What can you conclude about the **vertex** of the parabola?
33. The vertex of a parabola is in quadrant 4 and the coefficient "a" is negative. What can you conclude about the **nature of the roots**?	34. The graph of a quadratic function has 1 rational root. What can you conclude about the **value** of the discriminant?	35. The graph of a quadratic function has 2 imaginary roots. What can you conclude about the **value** of the discriminant? Describe the **x-intercepts**.

Graph the following Parabolas. Answer the related questions.

1. $y = -\frac{1}{4}x^2 - 2x - 6$



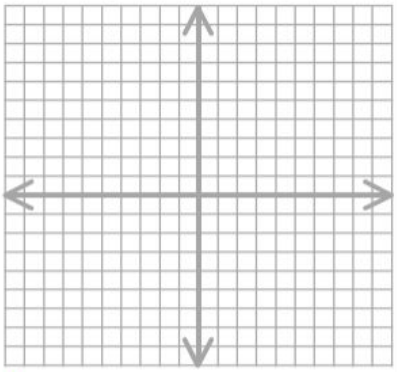
Vertex _____

x-int(s) _____

y-int _____

Domain _____

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



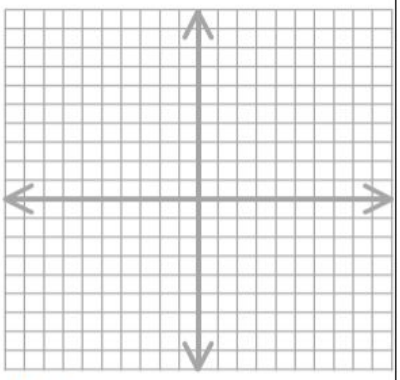
Vertex _____

Max/Min _____

y-int _____

x-int(s) _____

3. $y = (x-2)^2 - 3$



Vertex _____

Range _____

AOS _____

y-int _____

Convert the following functions into Standard Form:

4. $y = \frac{2}{5}(x-10)(x+5)$

5. $g(x) = 2(x-3)^2 - 12$

Write a quadratic function in standard form whose graph has the given characteristics.

6. **x-intercepts:** $(-2,0)$ *and* $\left(\frac{3}{2},0\right)$

point on graph: $\left(4,\frac{15}{2}\right)$

7. **points on graph:**
$(0,-1),(2,-1)$ *and* $(3,-7)$

Write the function in vertex form in order to graph the parabola and find the following.

8. $y = \frac{1}{4}x^2 - 4x + 6$

Vertex Form: _____

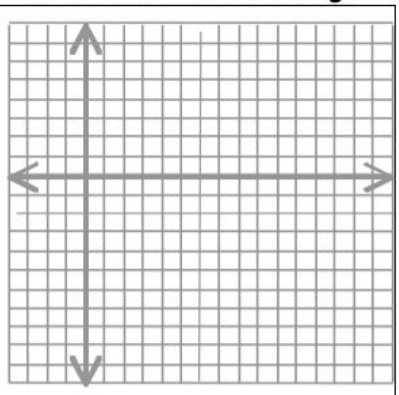
Vertex: _____

x-intercept(s): _____

AOS: _____

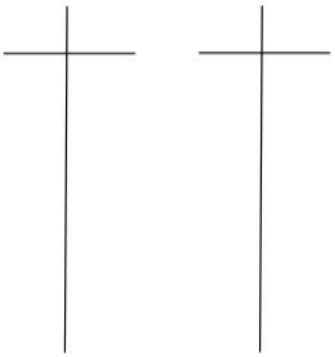
y-intercept: _____

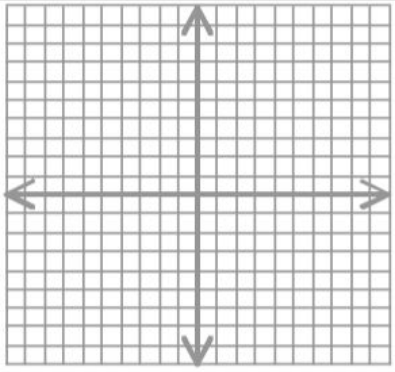
Max / Min: _____



Graph the quadratic inequality.

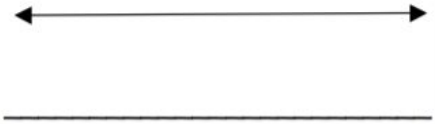
9. $y \leq 3x^2 + x + 2$
$y \geq -x^2 - 3x - 2$





Solve each quadratic inequality. State the final solution in inequality notation.

10. $2x^2 + 13x < -6$



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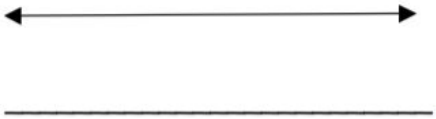
11. $x^2 - 18 \geq 3x$



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12. A thrown ball hits the ground and bounces along a parabolic path given by $y = \frac{-2}{9}x^2 + \frac{52}{9}x - \frac{320}{9}$ where x is measured in feet.

What is the maximum height that the ball reaches on this bounce?