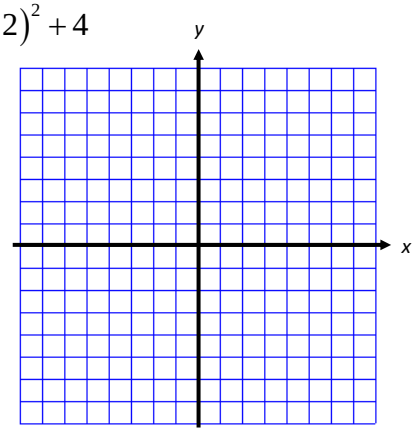
Honors Algebra 2 **Name: _____**
Chapter 2b Review **Block: _____**

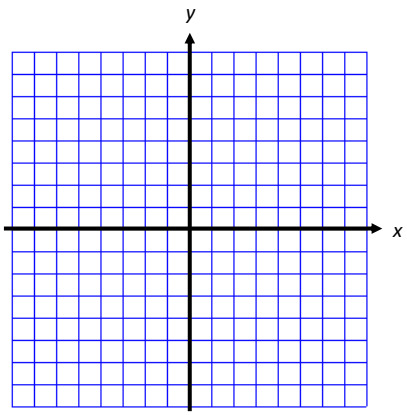
No Calculator

Graph the function with at least 3 labeled points.

1. $g(x) = -\frac{1}{3}(x+2)^2 + 4$



2. $h(x) = 5x^2 + 1$



Factor each expression.

3. $4x^2 - 20x + 25$

4. $25x^2 - 36$

4. Solve the equation by factoring.

a) $x^2 + 11x = -10$

b) $3x^2 - 9x = 0$

c) $8x^2 - 10 = 38x$

5. For the following function: $f(x) = 2x^2 - 3x + 1$. Find the roots for the graph of the quadratic function…

a) by factoring

b) by completing the square

c) by using the quadratic formula

6. Write the quadratic function in **standard form** with the given zeros.

a) zeros of –5 and $\frac{3}{7}$.

b) zeros of $-\frac{6}{5}$ and 2

7. a) Complete the square to rewrite $y = 3x^2 - 12x + 7$ in vertex form.

b) Identify the vertex of the function in part (a).

8. Find the zeros (over the complex number system) using the quadratic formula.

a) $f(x) = x^2 - 14x + 39$

b) $f(x) = 10x^2 + 9x + 4$

9. Find the type and number of solutions. Explain how you arrived at your answer in a sentence or two.

a) $8x^2 - 5x = -9$

b) $3x^2 + 2x - 6 = 3$

10. Simplify. Write the answer in $a+bi$ form.

a) $\sqrt{-36}$

b) $\sqrt{-80}$

c) $(3 - 5i) - (6 - i)$

d) $(-6 + 4i) + (7 - 2i)$

e) $(-6 + 4i)(7 - 2i)$

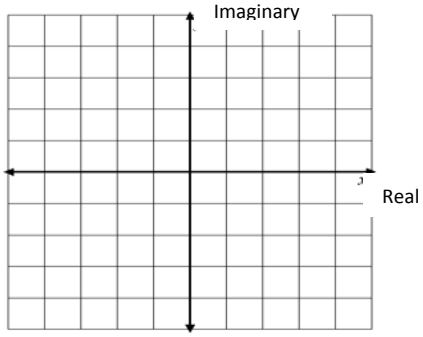
f) $\frac{3 - i}{4 - 2i}$

11. Solve for x (over the complex number system) and simplify the answer(s):

a) $x^2 - 20x + 125 = 0$

12. Plot the pair of numbers in the complex plane.

$3 + 2i,\ -1 - 4i$



13. Find $|3+7i|$

14. Solve (over the complex number system) and simplify your answer:

a) $\frac{1}{3}(x+7)^2 = 5$

b) $2(x+9)^2 = -8$

15. Solve the inequality using algebra and a sketch: $3x^2 + 4x - 3 \le 1$

16. Graph the inequality

a) $y \ge x^2 + 2x + 5$

b) $y > -2x^2 + 8x - 14$

Calculator Allowed

17. The highway mileage *m* in miles per gallon for a compact car is approximated by $m(s) = -0.025s^2 + 2.45s - 30$, where *s* is the speed in miles per hour

a) What is the maximum mileage for this compact car to the nearest tenth of a mile per gallon?

b) What speed results in this mileage?

18. A football is kicked from ground level with an initial vertical velocity of 48ft/s. The formula for projectile motion is $h(t) = -16t^2 + v_0 t + h_0$.

a) Model the height of the ball as a function of the time after it is hit.

b) How long is the ball in the air?

19. Solve the inequality using any method: $2x^2 + 3x + 6 > 5$

20. A business offers educational tours to Patagonia, a region of South America that includes parts of Chile and Argentina. The profit *P* for *x* number of persons is modeled by the equation $P(x) = -25x^2 + 1250x - 5000$. The trip will be rescheduled if the profit is less than $7500. How many people must have signed up if the trip is rescheduled? Write your answer as an inequality.

21. Claire is participating in a running club and keeps record of how many miles she runs. The data below shows the distances that Claire has run after so many days. Find the quadratic model for the number of miles ran in the amount of days given. Use the model to estimate the number of miles that Claire ran in 25 days.

Claire's Running Record

Days	Miles
10	12.3
20	34.4
30	66.5
40	108.6
50	160.7