Name: _____ **Date:** _____

H10: Quadratic Test Review

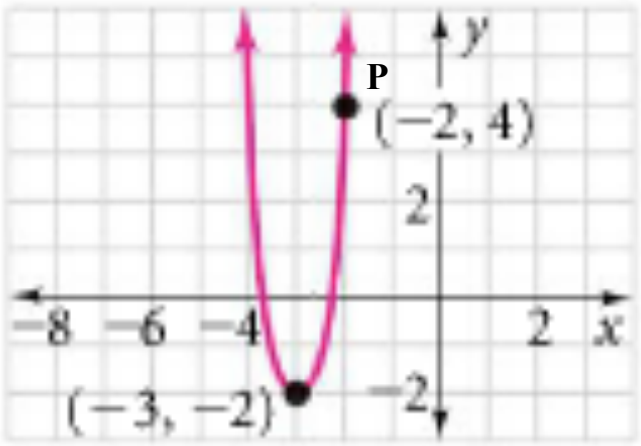
Determine whether the function is linear or quadratic. Identify the quadratic, linear, and constant terms.

1. $f(x) = (3x + 2)(-4x - 5)$

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

Identify the vertex and the axis of symmetry of the parabola. Identify points corresponding to *P* and *Q*. Answer the function questions to the side.

3



Is it a function?

Domain: Range:

x-intercepts: y-intercepts:

What is the max or min?

Where does the max or min occur?

Increasing/Decreasing: Positive/Negative:

Write an equation in standard form:

End Behavior:

Is the inverse a function?

Vertex: Axis of Symmetry:

P'=

Describe all transformations:

4 Your factory produces lemon-scented widgets. You know that each unit is cheaper, the more you produce. But you also know that costs will eventually go up if you make too many widgets, due to the costs of storage of the overstock. The guy in accounting says that your cost for producing x thousands of units a day can be approximated by the formula $C = 0.04x^2 - 8.504x + 25302$. Find the daily production level that will minimize your costs.

5. A skating rink manager finds that revenue R based on an hourly fee F for skating is represented by the function $R = -480F^2 + 3120F$. What is the maximum revenue of the skating rink?

6. A diver is standing on a platform and jumps from the platform. The equation $h = -16t^2 + 24t + 8$, where h is his height above the water, t is the time. How long will it take for him to hit the water?

7. A duck dives under water and its path is described by the quadratic function $y = 2x^2 - 4x$, where y represents the position of the duck in meters from the water and x represents the time in seconds. When was the duck at a depth of 5m?

8. A ball is thrown and follows the path described by the function $h(t) = -5t^2 + 20t + 1$, where h is the height of the ball and t is the time since the ball was released. From what height was the ball thrown?

9. The number of bacteria in a refrigerated food is given by $N(T)=20T^2 - 20T + 120$, for $-2 \leq T \leq 14$ and where T is the temperature of the food in Celsius. How many bacteria are in refrigerated food at a temper of 7 Celsius

10. You and a friend are hiking in the mountains. You want to climb to a ledge that is 20ft above your current elevation above sea level. The height of the grappling hook you throw is given by the function $h = -16t^2 - 32t + 5$. When will you be 12 feet above your starting position?

Simplify each radical expression.

11. $\sqrt{-150x^2}$

12. $\sqrt[3]{-135x^5y^9}$

13. $3xy^3\sqrt{96x^9y^{32}z}$

14. $\sqrt[4]{-512}$

Simplify the expression.

15. $(-1-4i)+2i(3-9i)$

16. $(6-4i)-(-4+5i)$

17. $(7i)(-3i)$

18 $(4-2i)(-6+5i)$

19. $(-3+\sqrt{-25})^2$

20. i^{11}

Solve the equation. Use exact answers when appropriate.

21. $-3x^2+8x-5=0$

22. $3x^2+4x-3=0$

23. $x^2+11=6x$

24. $6x^2-2x=-5$

25. Write the equation of a graph that is symmetric about the line x = -2

Identify the vertex, axis of symmetry, what is the max (or min), y-intercept and whether the graph opens up or down.

26. $y = -(x+5)^2 - 3$

vertex _____

axis of symmetry _____

Circle one: Max or Min

What is max/min _____

y-intercept _____

open up / down _____

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

vertex _____

axis of symmetry _____

Circle one: Max or Min

What is max/min _____

y-intercept _____

open up / down _____

28. Determine the number of x-intercepts to the function: $5x^2 - 4x + 2 = 0$.

29. Find the values of k for which $x^2 + kx + 9 = 0$ has two imaginary solutions.

30. Write a quadratic equation with the given solutions: $\frac{3 \pm \sqrt{-11}}{2}$

31. Write the equation $y = 2x^2 - 8x + 1$ into vertex form.

Factor each expression:

32. $15x + 30$
33. $15x^3 + 25x^2 - 5x$
34. $8y^4 + 6y^2$
35. $4x^2 - 1$
36. $9x^2 - 100$
37. $16x^2 - 50$
38. $x^2 + 16x + 64$
39. $x^2 + 13x + 40$
40. $x^2 - 4x - 32$
41. $25x^2 - 20x + 4$
42. $x^2 - 4x - 21$
43. $2x^2 - 22x + 48$
44. $10x^3 - 25x^2 - 35x$
45. $3x^2 + 13x + 10$
46. $4x^2 + 9x + 2$
47. $9x^2 + 10x + 1$
48. $5x^2 + 9x - 2$
49. $6x^2 + 55x + 9$
50. $x^3 + 27$
51. $8x^3 - 216$
52. $2x^3 + 16$

46. $x^4 - 9x^2 + 14$
47. $x^4 + 7x^2 - 18$
48. $x^2 + 3x + xk + 3k$
49. $m^2 + mn - 3m - 6n$