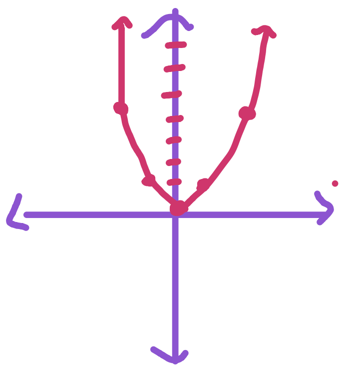
NAME: ____________________ PERIOD: __________ DATE: __________

Homework Problem Set

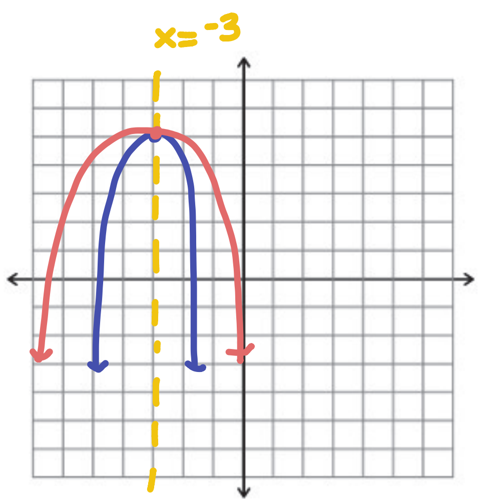
1. Khaya stated that every y-value of the graph of a quadratic function has two different x-values. Do you agree or disagree with Khaya? Explain your answer.



TRUE, EXCEPT AT THE VERTEX

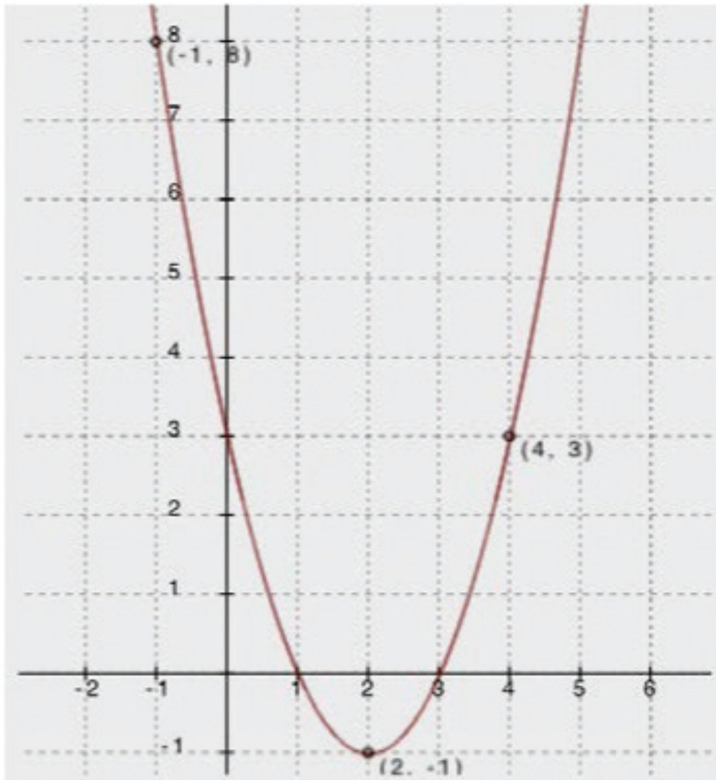
2. Is it possible for the graphs of two *different* quadratic functions to each have $x = -3$ as its line of symmetry and both have a maximum at $y = 5$? Explain and support your answer with a sketch of the graphs.

YES



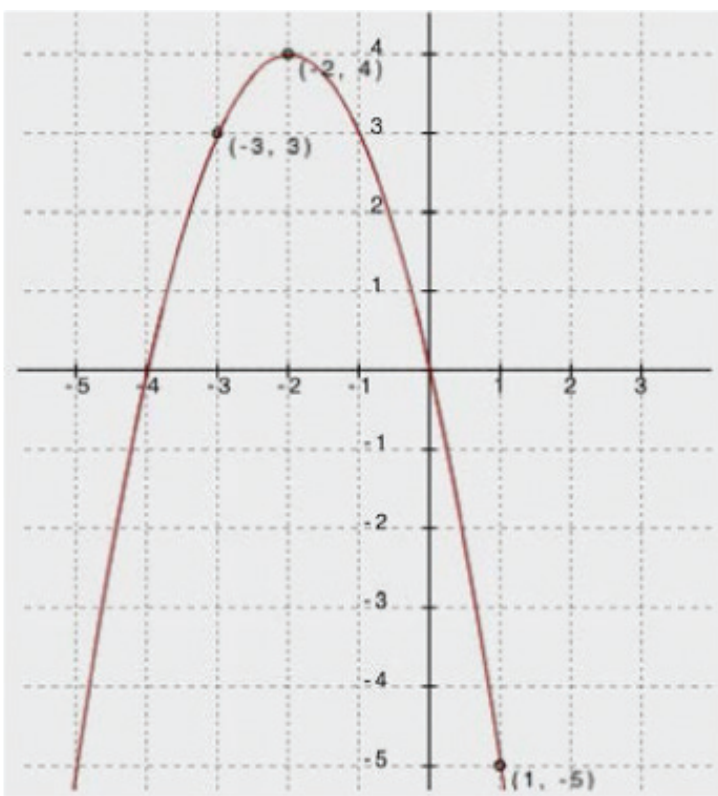
3. Use the graphs of quadratic functions (Graph A and Graph B) to fill in the table and answer the questions on the following page.

Graph A



x	$f(x)$
−1	8
0	3
1	0
2	−1
3	0
4	3
5	8

Graph B



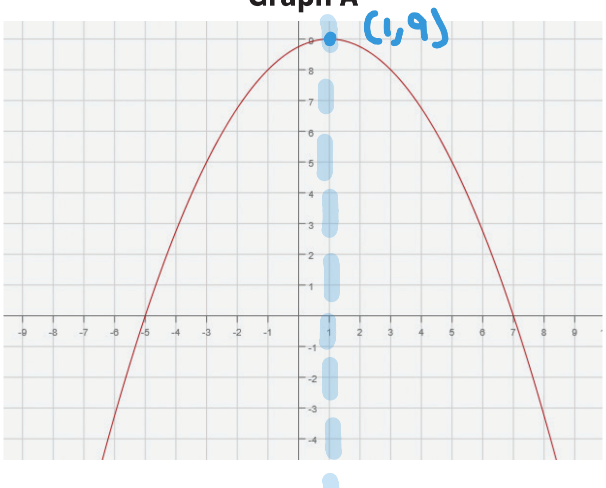
x	$f(x)$
−5	−5
−4	0
−3	3
−2	4
−1	3
0	0
1	−5

Use your graphs and tables of values from Problem 3 to fill in the blanks in the table below.

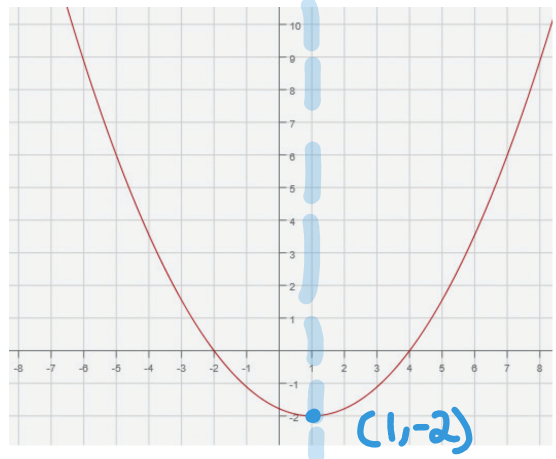
		Graph A		Graph B	
4.	***x*-Intercepts**	(3,0)	(1,0)	(-4,0)	(0,0)
5.	**Vertex**	(2,-1)		(-2,4)	
6.	**Sign of the Leading Coefficient**	+		—	
7.	**Vertex Represents a Minimum or Maximum?**	minimum		maximum	
8.	**Points of Symmetry**	Find $f(-1)$ and $f(5)$. f(-1) = 8 f(5) = 8 Is $f(7)$ greater than or less than 8? Explain. greater		Find $f(-1)$ and $f(-3)$. f(-1) = 3 f(-3) = 3 $f(2) = -12$. Predict the value for $f(-6)$ and explain your answer. f(-6) = -12 symmetry	
9.	**Increasing and Decreasing Intervals**	On what intervals of the domain is the function depicted by the graph increasing? (2, ∞) On what intervals of the domain is the function depicted by the graph decreasing? (-∞, 2)		On what intervals of the domain is the function depicted by the graph increasing? (-∞, -2) On what intervals of the domain is the function depicted by the graph decreasing? (-2, ∞)	

10. Consider the following key features discussed in this lesson for the four graphs of quadratic functions below: *x*-intercepts, *y*-intercept, line of symmetry, vertex, and end behavior.

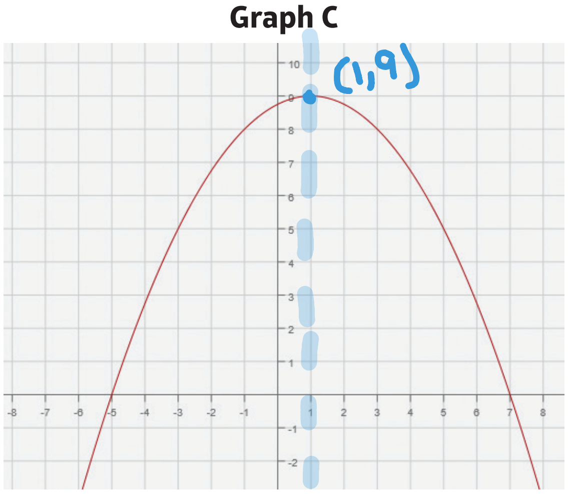
Graph A



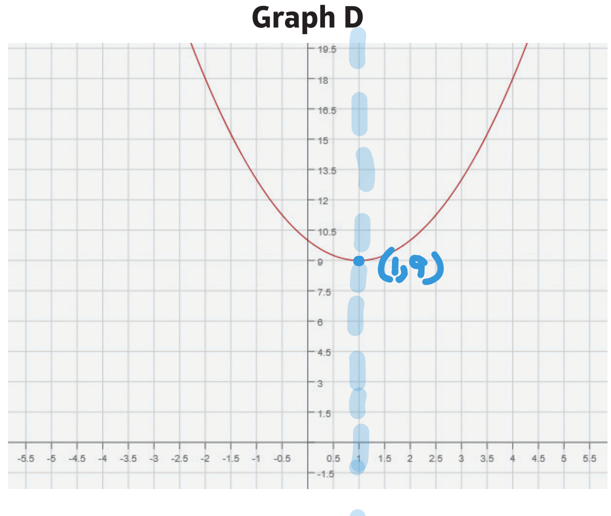
Graph B



Graph C



Graph D



A. Which key features of a quadratic function do Graphs A and B have in common? Which features are not shared?

axis of symmetry
$x=1$

* They Do Not HAve same vertex

B. Compare Graphs A and C, and explain the differences and similarities between their key features.

They're the same

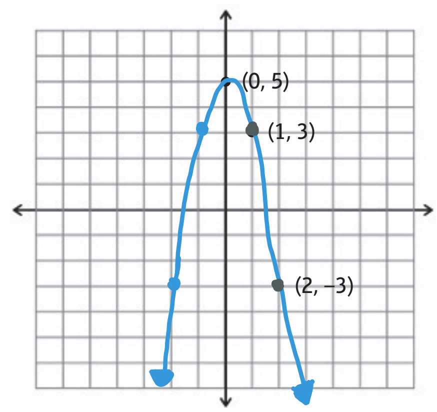
C. Compare Graphs A and D, and explain the differences and similarities between their key features.

They have the same vertex.
Graph A → concave down
Graph D → concave up.

D. What do all four of the graphs have in common?

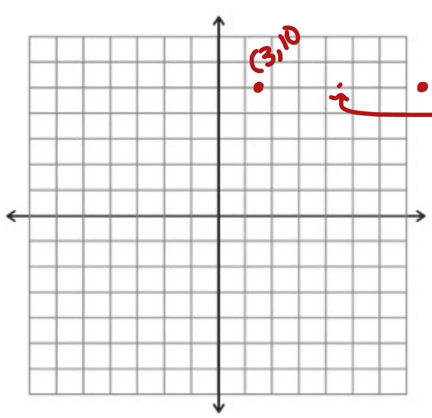
axis of symmetry (x=1)

11. Use the symmetric properties of quadratic functions to sketch the graph of the function at the right, given these points and given that the vertex of the graph is the point (0, 5).



12. If possible, find the equation for the axis of symmetry for the graph of a quadratic function with the given pair of coordinates. If not possible, explain why.

A. (3, 10) (15, 10)



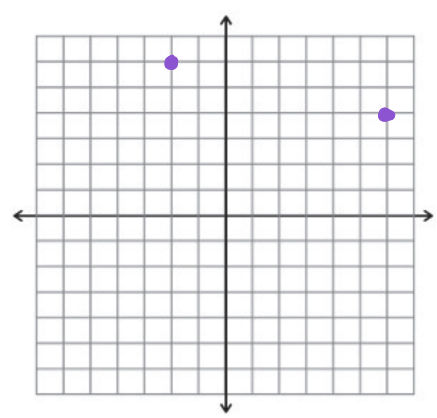
(15,10

halfway
(9,10)

$\frac{3+15}{2} = \frac{18}{2} = 9$

$\boxed{\text{AOS} \rightarrow x=9}$

B. (−2, 6) (6, 4)



NOT SYMMETRICAL
y-coordinates are different

Spiral REVIEW—Distribution Property and Combining Like Terms

For each problem below, use the distribution property and then combine like terms.

13. $-2(x+3)$

$-2x-6$

14. $5(x+4)+2(x+1)$

$5x+20+2x+2$

$7x+22$

15. $2(x+1)-3(x-7)$

$2x+2-3x+21$

$-x+23$

16. $-3(x-2)+3x$

$-3x+6+3x$

6

17. $-1(x+1)+2(x+1)$

$-1x-1+2x+2$

$x+1$

18. $-5(3x+4)$

$-15x-20$

Spiral REVIEW—Exponent Rules

Simplify each expression so that there are no negative exponents.

19. $2x \cdot x^2$

$2x^3$

20. $-a^2 \cdot a^3 \cdot a$

$-a^6$

21. $b^4 \cdot b^3 \cdot b^0$

b^7

22. $-5x \cdot 2x^3$

$-10x^4$

23. $z \cdot z \cdot z$

z^3

24. $g^2 \cdot g$

g^3

25. $(ab^3)^2$

a^2b^6

26. $\dfrac{x^{-2}}{x}$

$x^{-3} = \dfrac{1}{x^3}$

27. $\left(\dfrac{w}{z^2}\right)^{-1}$

$\dfrac{w^{-1}}{z^{-2}} = \dfrac{z^2}{w}$

28. $(y^2)^3 \cdot (y^0)^4$

$y^6 \cdot y^0$

y^6

29. $\dfrac{p^{-2}}{p^2 \cdot p^{-4}}$

$\dfrac{p^{-2}}{p^{-2}} = 1$

30. $(r^3)^0 \cdot (r^2)^{-1}$

$r^0 \cdot r^{-2} = r^{-2} = \dfrac{1}{r^2}$