Name: **KEY** Period: _____

Unit 7 Review—Introduction to Quadratic Functions

1. Identify which table is quadratic and complete the following information about the quadratic function: **GRAPH A**

a. coordinates of the vertex __$(0, -1)$__
b. max/**min**
c. equation of the line of symmetry __$X = 0$__
d. domain : $\mathbb{R}$
e. range: $\mathbb{R} \geq -1$

the minimum vertex means all values are greater

Graph A. **Quadratic**

a. $(0,-1)$
b. M/**M**
c. $X = 0$
d. $\mathbb{R}$
e: $\mathbb{R} \geq -1$

x	y
−5	24
−4	15
−3	8
−2	3
−1	0
0	−1
1	0

−9, −7, −5, −3, −1, ⌀ → 2, 2, 2, 2, 2

Graph B. **Not.**

x	y
0	3
1	7
2	27
3	127
4	627
5	3127
6	15627

4, 20, 100, 500, 2500, 12500

Graph C. **Linear**

x	y
−4	21
−3	17
−2	13
−1	9
0	5
1	1
2	−3

−4, −4, −4, −4, −4, −4

1. Given the equation $y = -3x^2 + 1$, write the equation of the parabola if the graph has been shifted up 5 units.

$+5$

$$y = -3x^2 + 6$$

2. Given the equation $y = 4x^2 - 3$, write the equation of the parabola if the <u>lead coefficient</u> has been doubled.

x^2

$$y = 8x^2 - 3$$

3. Compare the graphs of $y = -2x^2 + 1$ and $y = -2x^2 - 4$.

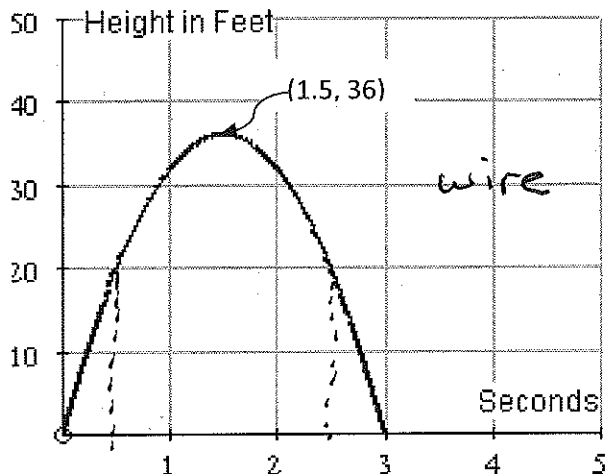The 2nd graph is shifted down 5 units from the 1st

4. Compare the graph of $y = -2x^2$ to the (quadratic parent function. $y = x^2$)

It is narrower and has been flipped over to open down
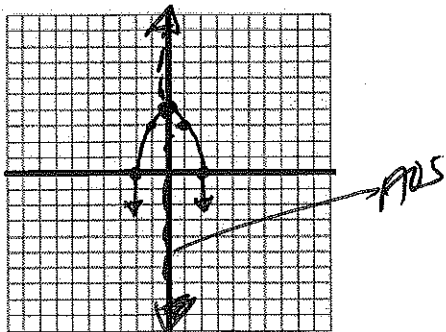
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5. You are trying to throw a ball over a wire that is 30 feet above the ground. The height of the ball is modeled by the equation $y = -16t^2 + 48t$.


a. Approximately how many seconds will it take to clear the wire? **1 second**

b. State the domain and range of the graph.

Domain: $0 \le x \le 3$

Range: $0 \le y \le 36$

c. At approximately what times was the ball at 20 feet?

0.5 second and 2.5 seconds

For #~~7-8,~~ write the equation for the axis of symmetry (AOS), identify the vertex, solutions, y-intercept, domain, and range. Also identify whether the vertex is a maximum or minimum point.

6. $y = -x^2 + 4$ $a = -1$ $C = 4$

AOS: $\frac{-b}{2a} = \frac{0}{2(-1)}$ $X = 0$ opens down

Vertex: $(0, 4)$ $y = -x^2 + 4$
$y = -(0)^2 + 4$
$y = 4$

(Max/Min) open down

x-int/roots/zeros/solutions: $(2,0)(-2,0)$

y-intercept: $(0, 4)$
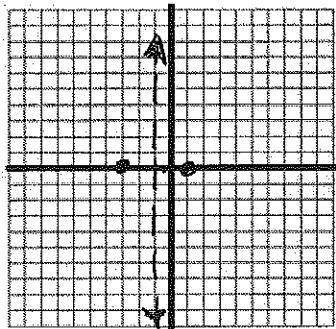
Domain: $\mathbb{R}$

Range: $\mathbb{R} \le 4$

7. $f(x) = x^2 - 2x + 6$

$a = 1$ $b = -2$ $C = 6$

AOS: $\frac{-b}{2a}$ $\frac{2}{2(1)} = 1$ $\boxed{X = 1}$

Vertex: $(1, 5)$

(Max/Min) opens up

x-int/roots/zeros/solutions: **None**

y-intercept: $(0, 6)$

Domain: $\mathbb{R}$

Range: $\mathbb{R} \ge 5$
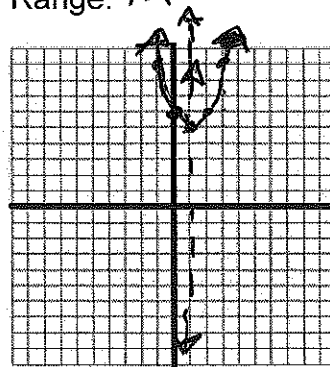
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8.   If one of the roots of a parabola is (-3,0) and the vertex is located at (-1, y), where would the other root be? Sketch a graph of this parabola. Can't not enough Information

Roots: (-3,0) and (1, 0)

9. Using the equation, $y = 2x^2 + 12x + 9$,

a.   Identify a, b, and c. $a = 2$ $b = 12$, $c = 9$

b.   Write the equation of the axis of symmetry.

$X = \dfrac{-b}{2a}$ $X = \dfrac{-12}{2(2)}$ $X = -3$

c.   Name the coordinates of the vertex.

$(-3, -9)$

$y = 2x^2 + 12x + 9$
$y = 2(-3)^2 + 12(-3) + 9$
$y = -9$

d.   State the y-intercept.

$(0, 9)$

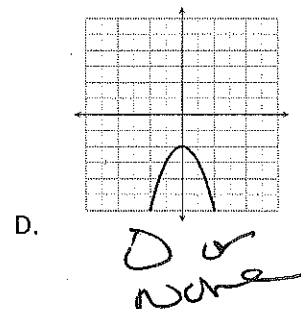10.   Which of the following equations has exactly one real zero?
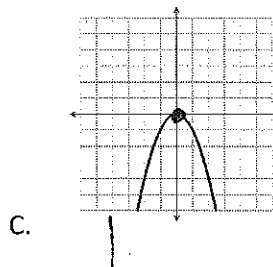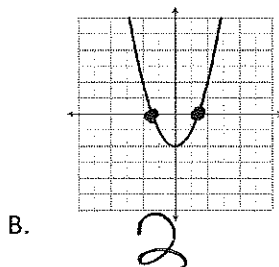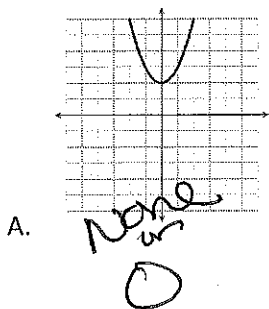
a. $y = 2x^2 + 1$
None
0

b. $y = -3x^2$
1

c. $y = x^2 - 4$
2

d. $y = -x^2 - 5$
None
0

11.   Look at each of the graphs below and mark the zeros. Then state the number of zeros for each graph.

A.   None
0

B.   2

C.   1

D.   0 or none

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12. Given $f(x) = 2x^2 - 3x + 2$, find $f(-4)$.

$f(-4) = 2(-4)^2 - 3(-4) + 2$

$f(-4) = 46$

f(x) means y
can use
also y=

13. Given $f(x) = -x^2 + x - 2$, find $f(5)$.

$f(5) = -(5)^2 + (5) - 2$

$f(5) - 25 + 5 - 2$

$f(5) = -22$

1]
2] 2nd table
find x-value
what y

14. Given $f(x) = x^2 - 5x - 1$, find $f(-2)$.

$f(-2) = (-2)^2 - 5(-2) - 1$

$f(-2) = 13$

3] & see
what
is

15. What are the x-intercepts of $y = -x^2 + 8x + 9$?

where
y=0
* use
table

$(-1, 0) \quad (9, 0)$

16. What are the solutions of $y = 2x^2 + 11x + 9$?

2 solutions

$(-1, 0) \quad (-4.5, 0)$

* won't show
up in table
make sure graph
use to check

17. What is the vertex of $y = 2x^2 + 11x + 9$? Write your answer as an ordered pair.

$X = \dfrac{-b}{2a} = \dfrac{-11}{2(2)} = \dfrac{-11}{4}$

2nd trace
1: value
$X = \dfrac{-11}{4}$ gives you y-value

$\left(\dfrac{-11}{4}, -6.125\right)$

18. Write the equation for the axis of symmetry of $y = 2x^2 + 11x + 9$.

$X = \dfrac{-11}{4}$

19. How do you know if the vertex of a parabola is a maximum or minimum point?

- if the a-value is a positive, the
vertex is a minimum because it opens up
- If the a-value is a negative, the vertex
is a maximum because it opens down

20. What is the domain and range of the quadratic parent function?

Domain: $\mathbb{R}$ Range: $\mathbb{R} \geq 0$