Algebra I
Unit 9 Review
(solutions, x-intercepts)

Name **Key**

Find the roots of each of the following equations. use any method.

1. $2x^2 - 3x - 14 = 0$

$(x+2)(2x-7)=0$

$-28x^2$
$-7x \times 4x$ | $2x$ | $2x^2$ | $4x$ |
$-3x$ | -7 | $-7x$ | -14 |

$x+2=0 \quad 2x-7=0$

$\{-2, 7/2\}$

OR USE CALC.

2. $x^2 - 81 = 0$

$a=1 \quad b=0 \quad c=-81$

$x = \dfrac{-0 \pm \sqrt{(0)^2 - 4(1)(-81)}}{2(1)}$

$\{-9, 9\}$

3. $x^2 + 7x = -10$

$x^2 + 7x + 10 = 0$

x	y
-5	0
-4	-2
-3	-2
-2	0

$\{-5, -2\}$

4. $6x^2 = 42x$

$6x^2 - 42x = 0$

$6x(x-7) = 0$

$6x = 0 \qquad x-7=0$

$\{0, 7\}$
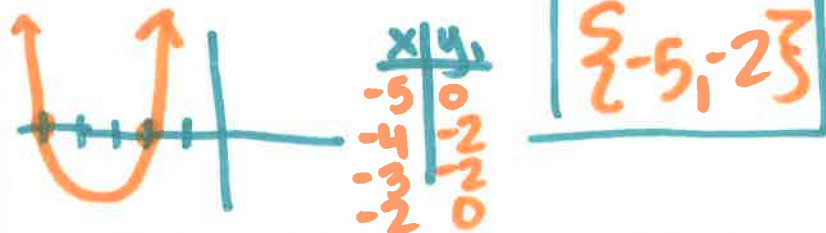
Find one of the solutions of the following equations

5. $3x^2 - 8x = -4$

$3x^2 - 8x + 4 = 0$

A. (-2,0)

B. $\left(-\dfrac{2}{3}, 0\right)$

C. $\left(0, \dfrac{2}{3}\right)$

D. (2,0)

$\{\dfrac{2}{3}, 2\}$

6. $x^2 - 10x = -21$

$x^2 - 10x + 21 = 0$

A. (-3,0)

B. (7,0)

C. (0,7)

D. (3,7)

x	y
2	5
3	0
4	-3
5	-4
6	-3
7	0
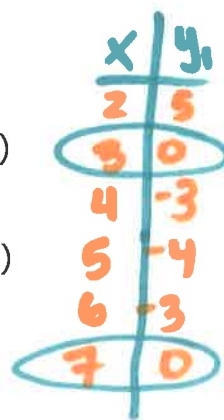
7. Find the quadratic equation (in factored form) that has the given solutions. x : { -7, 2}

A. y=(x+7)(x-2)
B. y=(x-7)(x+2)
C. y=(x+7)(x+2)
D. y=(x-7)(x-2)

$x=-7 \quad x=2$

$x+7=0 \quad x-2=0$

$(x+7)(x-2)=0$

8. Which of the following equations represents problem #7 in standard form?

Double Distribute or Use box

A. $y = x^2 + 9x + 14$
B. $y = x^2 - 5x - 14$
C. $y = x^2 + 5x + 14$
D. $y = x^2 + 5x - 14$

|	x	+7
x	x^2	7x
-2	-2x	-14

dependent **independent**

9. If *y* is a function of *x* in the equation $y = x^2 - 9$ which statement is true?

F The independent variable *x* is equal to 9 less than the square of the dependent variable *y*. $x = y^2 - 9$
G The independent variable *y* is equal to 9 less than the square of the dependent variable *x*.
H The dependent variable *y* is equal to 9 less than the square of the independent variable *x*.
J The dependent variable *x* is equal to 9 less than the square of the independent variable *y*.

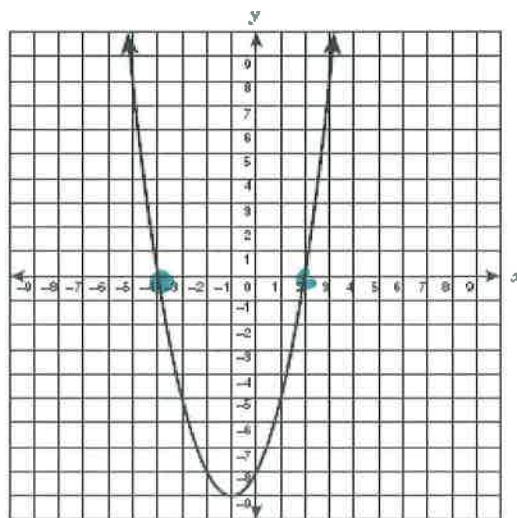10. Which of the following does not represent the function $f(x) = \frac{1}{4}x^2 - 3$? **Put in calculator**

A.

B.
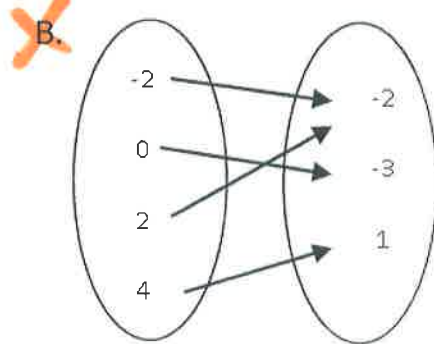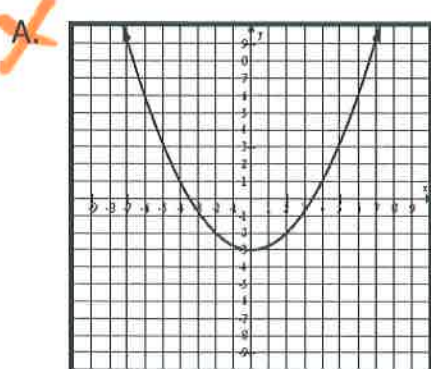
C.

x	y
-3	-2
-1	-2.75
0	-3
3	-2

D. The dependent variable y is equal to three less than the product of one-fourth and the square of the independent variable x.

11. What are the roots of the function graphed to the right?

A. (-1, -9) and (0, -8)

B. (0, -4) and (2, 0)

C. (-4, 0) and (2, 0)

D. (0, 2) and (0, -4)

$\{-4, 2\}$

$y = 0.$

12. Find the x-coordinate of the vertex in the equation $y = x^2 - 3x + 2$

$a = 1 \quad b = -3 \quad c = 2$

$x = \frac{-b}{2a} = \frac{-(-3)}{2(1)} = \frac{3}{2}$

$x = \frac{3}{2}$

13. How many roots does the function $y = x^2 - 2x - 3$ have?

2 roots

wide-small # narrow-big#

14. Which lists the functions of the form $y = ax^2$ in order from the widest to the narrowest?   *ignore negatives*

A. $y = \frac{3}{5}x^2, y = \frac{1}{3}x^2, y = \frac{11}{8}x^2, y = 2x^2$

B. $y = \frac{1}{3}x^2, y = \frac{3}{5}x^2, y = \frac{11}{8}x^2, y = 2x^2$ *(circled)*

C. $y = 2x^2, y = \frac{11}{8}x^2, y = \frac{3}{5}x^2, y = \frac{1}{3}x^2$

D. $y = 2x^2, y = \frac{11}{8}x^2, y = \frac{1}{3}x^2, y = \frac{3}{5}x^2$

GRAPH

15. How would the graph of $y = -x^2 + 2$ compare with the graph of $y = -x^2 - 10$?

A. The graph of $y = -x^2 + 2$ is 8 units above the graph of $y = -x^2 - 10$.

B. The graph of $y = -x^2 + 2$ is 12 units above the graph of $y = -x^2 - 10$.   *(circled)*

C. The graph of $y = -x^2 + 2$ is narrower than the graph of $y = -x^2 - 10$.

D. The graph of $y = -x^2 + 2$ is wider than the graph of $y = -x^2 - 10$

16. The equation $f(x) = -x^2 + 16x + 336$ represents the total number of new Wii games that a store sells each week where x is the number of weeks since the game was released. If the store sold 204 games this week, how many weeks ago was the game released?

$204 = -x^2 + 16x + 336$
$-204 \qquad\qquad -204$
$0 = -x^2 + 16x + 132$ **CALCULATOR** $\{-x, 22\}$

22 weeks

17. The length of a rectangle is 3 cm more than the width. The area is 70 cm². Find the dimensions of the rectangle.

$\ell = 3 + w$

$w(3+w) = 70$
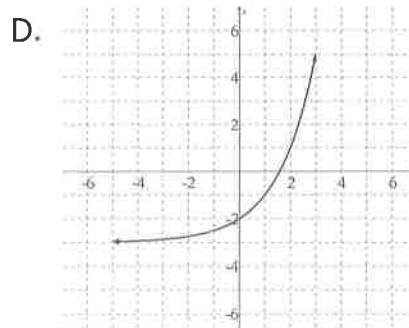
$3w + w^2 = 70$

$A = \ell w$ $w^2 + 3w - 70 = 0$
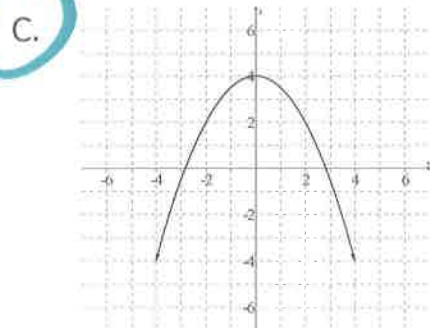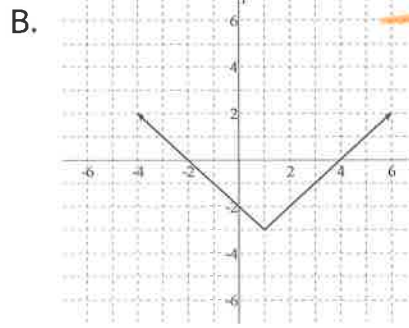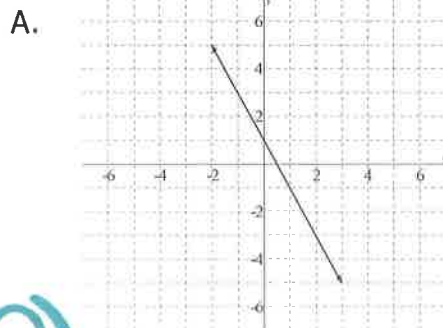
$(w-7)(w+10) = 0$

$\{7, -10\}$

$w = 7 \text{ cm}$
$\ell = 10 \text{ cm}$

18. Which one of these graphs has a parent function of $y = x^2$?

A.

B.

C.   *(circled)*

D.

19. Answer the following questions about the graph below.

a. What is the vertex? **(2,4)**

b. Is the vertex a minimum or maximum?

c. What are the roots of the quadratic? **(0,0) (4,0)**
   x-int.

d. What is the axis of symmetry? **X=1**

e. What is the value of f(1)? **X=1** **3**

f. What is the domain?

   A. all real numbers   B. $-1 \le x \le 5$
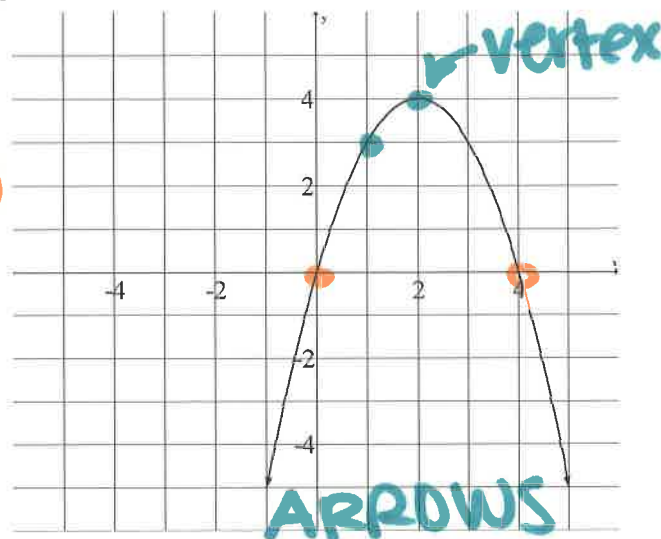
   C. $-5 \le x \le 4$ D. $x \le 4$

g. What is the range?

   ~~A.~~ all real numbers   B. $y > 4$

   C. $y \le 4$ D. $y < 4$

vertex

ARROWS

20. What are the three other words used for the solutions of a quadratic equation?

x-intercepts   roots   zeroes

21. A function is described by the equation $f(x) = x^2 - 3$. The replacement set for the independent variable is {-4, -1, 2, 4}. Which of the following is contained in the corresponding set for the dependent variable?

- **Plug into y=**
- **look @ table**

{13, -2, 1, 13}

A   6
B   2
C   -1
D   13

22. An object is hurled upward from the ground at an initial velocity of 128 ft/s. The height, *h*, in feet of the object at any given time, *t*, in seconds is $h(t) = 128t - 16t^2$. **calculator**

A. When will the object reach a height of 192 feet?
   2 sec & 6 sec

B. When will the object reach the ground?
   8 sec

C. When will the object reach its maximum height?
   4 sec

D. What is the maximum height of the object?
   256 ft

E. Graph this situation, labeling axes.

F. State the domain and the range of the situation.

   D: 0 ≤ x ≤ 8
   R: 0 ≤ y ≤ 256

height

time