Math 2 Review for Test 5 Name_____

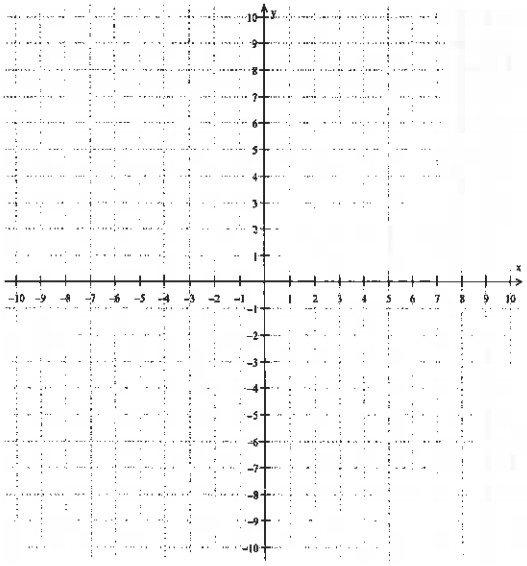
1. Solve each quadratic equation using a method of your choice. Show your work!

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

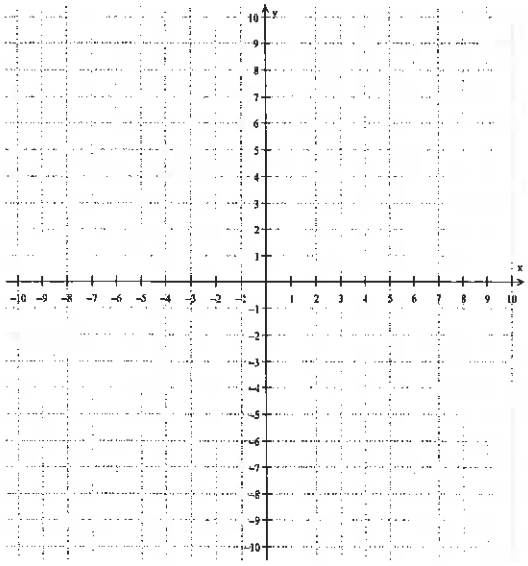
   b. $2x^2 + x - 28 = 0$

2. Find and identify all necessary points, then graph the parabola. Show all work.

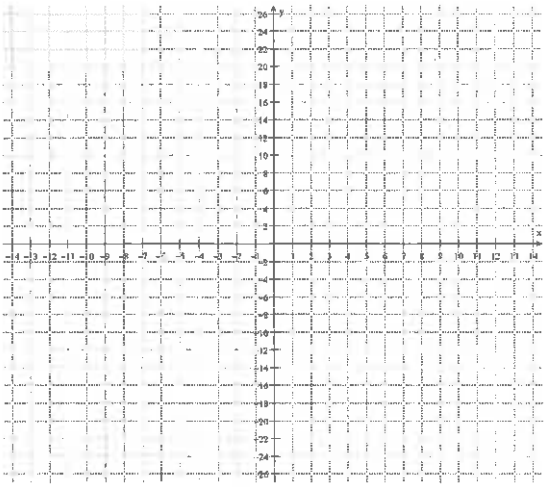
   a. f(x) = (x - 4)(x + 2)



   b. $-x^2 - 4x - 3 = g(x)$



c. $h(x) = x^2 - 10x + 25$



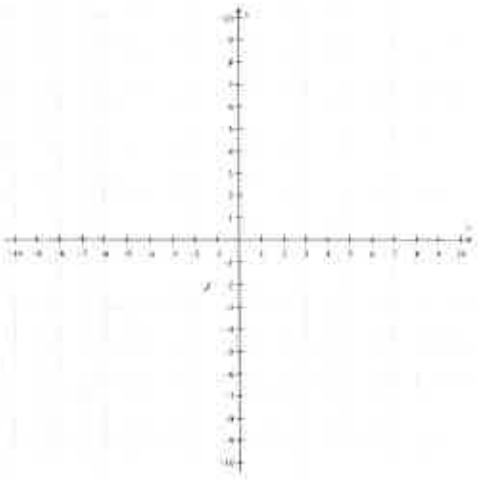
3. Find the equation of the inverse of the following functions. Show all work!

a. $N(x) = -3x + 4$

b. $G(x) = \frac{1}{4}x - 2$

4. Graph the function and the inverse on the grid. Label your function and the inverse.

f(x)=2x-3

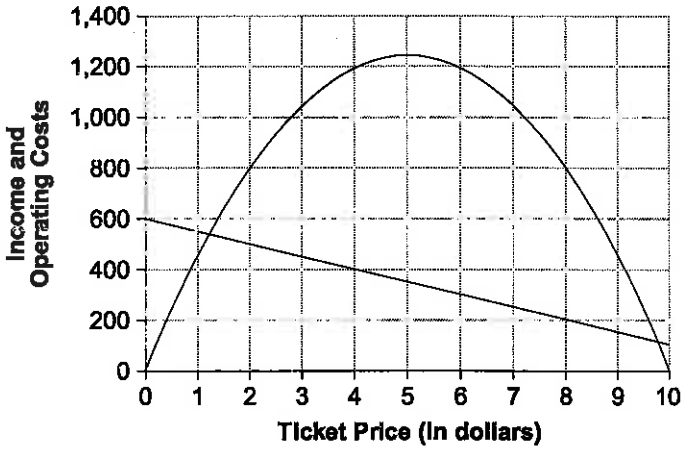


5. Complete the inverse of the table:

x	*f(x)*
1	5
2	7
3	9
4	11

6. Each year, the combined high school orchestras in Muse City stage a public concert.

Based on data from previous years, the organizers decided that the income and operating costs can be represented as functions of ticket price according to the following equations and graph. income from ticket sales I is related to ticket price t by the equation $I = 500t - 50t^2$. Cost C of operating the concert is related to ticket price t by the equation $C = 600 - 50t$.



a. How can you tell based on the Income equation that the parabola opens down?

b. What ticket price(s) would generate the greatest income? What is the greatest income? Explain how you obtained your answer.

Ticket price(s): _____ *Greatest income:* _____

c. For what ticket price(s) would the operating costs be equal to the income from ticket sales? Explain how you obtained your answer.

7. Mr. De Koch is working on his Punkin Chunkin launcher. He found that the rule $h(t) = 2 + 59t - 16t^2$ gives the height of the pumpkin (in feet) t seconds after it is launched.

Explain what each part of the equation means in the context of this situation.

8. Provide 4 differences as to how **the graph** of $f(x) = -4x^2 + 3x - 5$ compares to the graph of $g(x) = x^2$.

1)

2)

3)

4)

9. Solve the following quadratic equations algebraically or use the quadratic formula. Express all non-real solutions with $a \pm bi$.

a. $(x-4)^2 = -3$

b. $x^2 + 5x + 7 = 0$

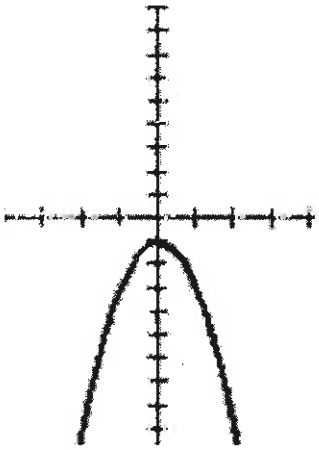
c. $x^2 + 10x + 24 = 0$

d. $8x^2 - 42x - 36 = 0$

10. Match each equation to a graph.

$y = .5x^2 + 1$ _____ $y = -.5x^2 + 1$ _____ $y = 5x^2 + x - 1$ _____ $y = -2x^2 - 1$ _____

A.



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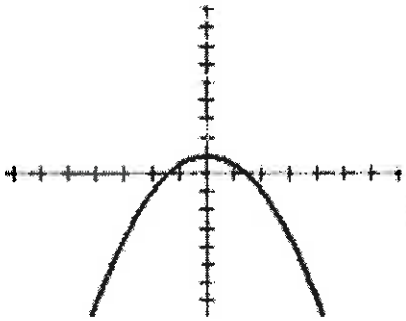
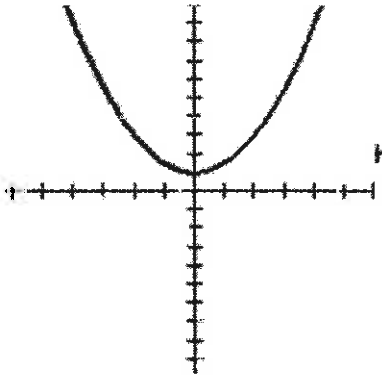
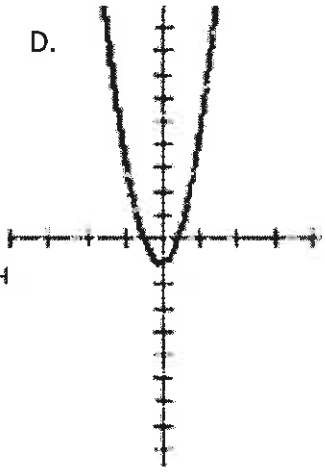


C.



D.



11. Explain how the graph of $h(t) = 8 + 14t - 16t^2$ is different from the graph of $y = x^2$.

12. The equation given in #11 models the height of a baseball thrown (h) at any time in seconds (t) after it is thrown. Explain what each part of the equation tells us about the situation.

a. What is the maximum height the baseball is thrown?

b. To the nearest hundredth of a second, determine how many seconds it takes the baseball to hit the ground after it is thrown.

Math 2 Review for Test 5 Name Key

1. Solve each quadratic equation using a method of your choice. Show your work!

28
1 28
2 14
4 7

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

$(x-3)(x-1)=0$

$x=1,3$

b. $2x^2 + x - 28 = 0$

$(2x-7)(x+4)=0$

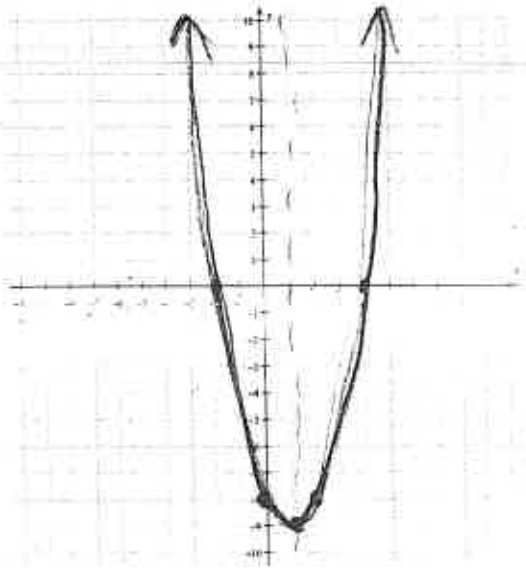
$x=-4$
$x=7/2$

2. Find and identify all necessary points, then graph the parabola. Show all work.

a. $f(x) = (x-4)(x+2)$

$f(1)=(1-4)(1+2)$
$=-9$ $(1,-9)$

$f(0)=-8$



b. $-x^2 - 4x - 3 = g(x)$

x-ints $-x^2-4x-3=0$

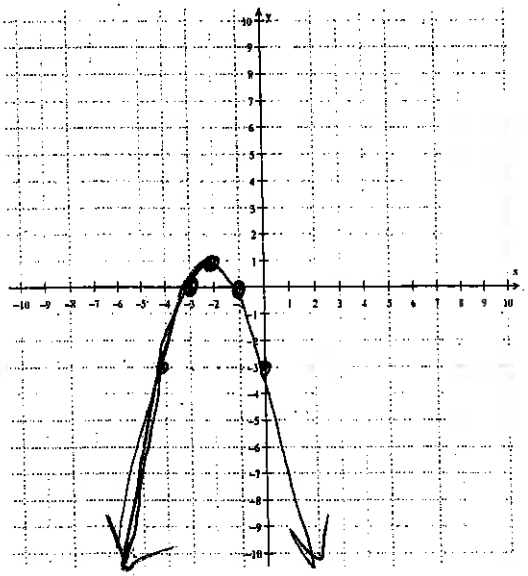
$x^2+4x+3=0$

$(x+3)(x+1)=0$

$(-3,0)$ $(-1,0)$

$g(-2)=-(-2)^2-4(-2)-3$
$=-4+8-3=1$ $(-2,1)$

$g(0)=-3$

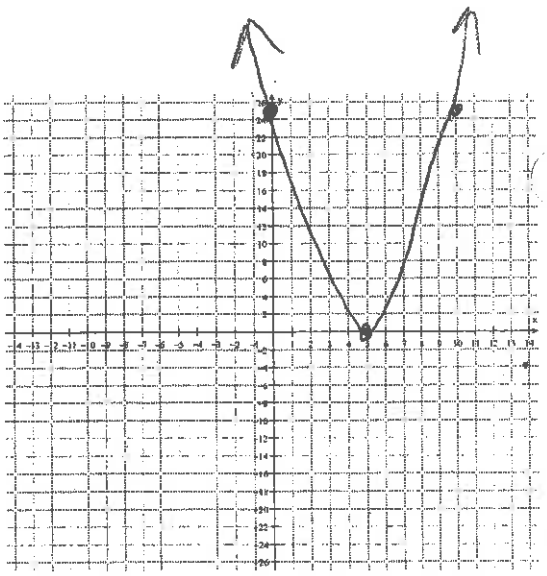


c. $h(x) = x^2 - 10x + 25$

$h(x) = (x-5)^2$

X-intpt $(5,0)$

y intpt $h(0) = 25$ $(0,25)$



3. Find the equation of the inverse of the following functions. Show all work!

a. $N(x) = -3x + 4$

Inverse $X = -3y + 4$

$X + 4 = -3y$

$N^{-1}(X) = \frac{X+4}{-3}$

b. $G(x) = \frac{1}{4}x - 2$

$X = \frac{1}{4}y - 2$

$X + 2 = \frac{1}{4}y$

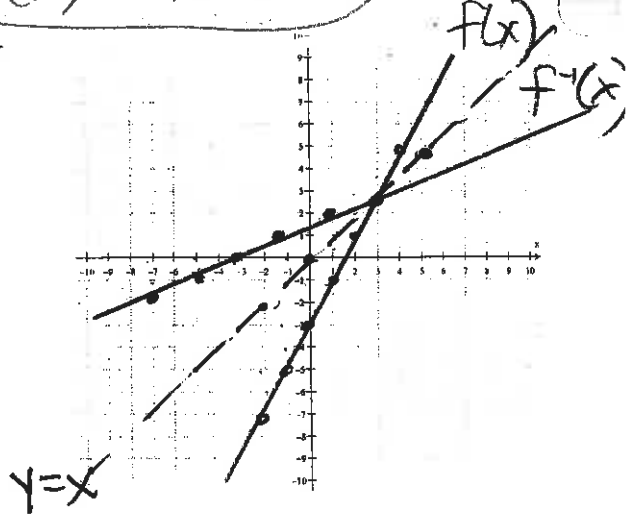
$G^{-1}(X) = 4X + 8$

4. Graph the function and the inverse on the grid. Label your function and the inverse.

f(x)=2x-3

X	f(x)
-2	-7
-1	-5
0	-3
1	-1
2	1

X	$f^{-1}(x)$
-7	-2
-5	-1
-3	0
-1	1
1	2



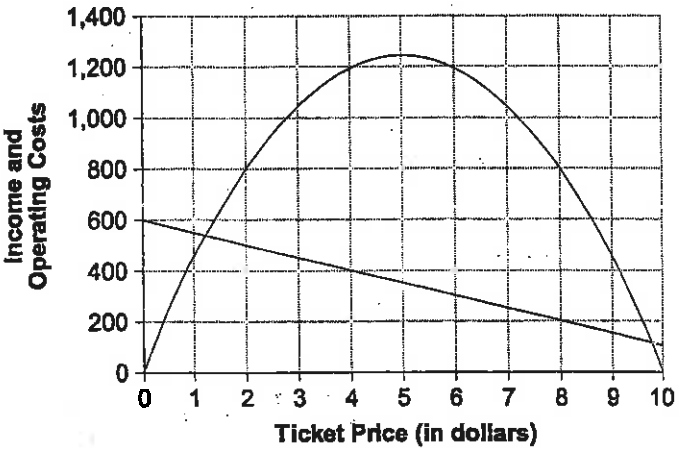
5. Complete the inverse of the table:

x	f(x)
1	5
2	7
3	9
4	11

X	$f^{-1}(x)$
5	1
7	2
9	3
11	4

6. Each year, the combined high school orchestras in Muse City stage a public concert.

Based on data from previous years, the organizers decided that the income and operating costs can be represented as functions of ticket price according to the following equations and graph. Income from ticket sales I is related to ticket price t by the equation $I = 500t - 50t^2$. Cost C of operating the concert is related to ticket price t by the equation $C = 600 - 50t$.



a. How can you tell based on the Income equation that the parabola opens down?

$-50t^2 \Rightarrow$ the coefficient of t^2 is negative.

b. What ticket price(s) would generate the greatest income? What is the greatest income? Explain how you obtained your answer.

Ticket price(s): $5 *Greatest income:* $1250

$I(5) = 1250$ vertex of Income equation.

$\frac{-b}{2a} = 5$

c. For what ticket price(s) would the operating costs be equal to the income from ticket sales? Explain how you obtained your answer.

$1.23 and $9.72. The solutions to

$500t - 50t^2 = 600 - 50t$

7. Mr. De Koch is working on his Punkin Chunkin launcher. He found that the rule $h(t) = 2 + 59t - 16t^2$ gives the height of the pumpkin (in feet) t seconds after it is launched.

Explain what each part of the equation means in the context of this situation.

2 - initial height
$59t$ - the initial velocity
$-16t^2$ gravitational pull

8. Provide 4 differences as to how **the graph** of $f(x) = -4x^2 + 3x - 5$ compares to the graph of $g(x) = x^2$.

1) Reflected over x-axis: f(x) opens down. g(x) up.
2) f(x) shifted down 5
3) f(x) vertically stretched.
4) f(x) moves horizontally (left/right)

9. Solve the following quadratic equations algebraically or use the quadratic formula. Express all non-real solutions with $a \pm bi$.

a. $(x-4)^2 = -3$

$x = 4 \pm \sqrt{3}i$

b. $x^2 + 5x + 7 = 0$

$x = -2.5 \pm \frac{\sqrt{3}i}{2}$

c. $x^2 + 10x + 24 = 0$

$x = -4$ or $x = -6$

d. $8x^2 - 42x - 36 = 0$

$4x^2 - 21x - 18 = 0$

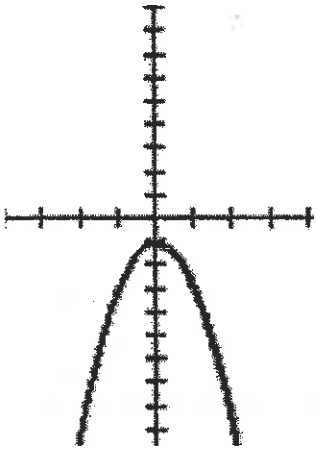
$x = \frac{21}{8} \pm \frac{a7}{8}$

$x = 6$ or $-3/4$

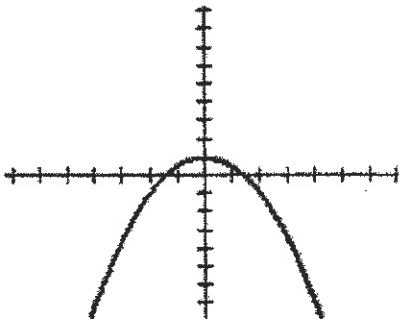
10. Match each equation to a graph.

$y = .5x^2 + 1$ C $y = -.5x^2 + 1$ B $y = 5x^2 + x - 1$ D $y = -2x^2 - 1$ A

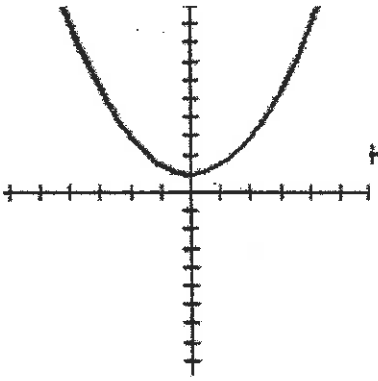
A.



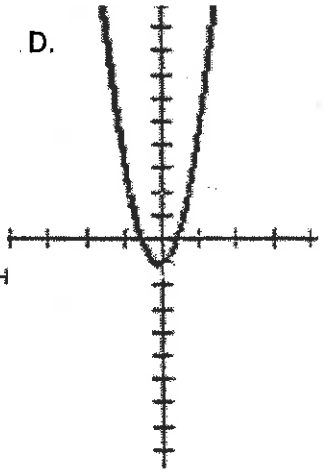
B.



C.



D.



11. Explain how the graph of $h(t) = 8 + 14t - 16t^2$ is different from the graph of $y = x^2$.

h(t) opens down, shifted over and up (8), and vertically stretched.

12. The equation given in #11 models the height of a baseball thrown (h) at any time in seconds (t) after it is thrown. Explain what each part of the equation tells us about the situation.

$-16t^2$ gravitational pull

$14t$ initial velocity

8 initial height

a. What is the maximum height the baseball is thrown?

$\frac{-b}{2a} = \frac{-14}{2(-16)} = \frac{7}{16}$

$h(\frac{7}{16}) = 11.0625$

11.06 feet high

b. To the nearest hundredth of a second, determine how many seconds it takes the baseball to hit the ground after it is thrown.

$0 = 8 + 14t - 16t^2$

$t = 1.269$

≈ 1.27 seconds