Math 2 - Honors
Unit 3 – More Quadratic Functions
Test Review

Name: _____
Date: _____ Pd: _____

➢ Simplify each of the following radicals.

1. $\sqrt{-24}$ $2i\sqrt{6}$	2. $\pm\sqrt{252}$ $\pm 6\sqrt{7}$	3. $-3\sqrt{-48}$ $-3 \cdot 4 \cdot i\sqrt{3}$ $-12i\sqrt{3}$	4. $\sqrt{50}$ $5\sqrt{2}$	5. $\pm\sqrt{63}$ $\pm 3\sqrt{7}$
6. $2\sqrt{147}$ $7 \cdot 2 \cdot \sqrt{3}$ $14\sqrt{3}$	7. $\frac{3}{4}\sqrt{64}$ $\frac{3}{4} \cdot 8$ $24/4 = 6$	8. $5\sqrt{-17}$ $5i\sqrt{17}$	9. $\pm\sqrt{162}$ $\pm 9\sqrt{2}$	10. $-\sqrt{\frac{25}{81}}$ $-\frac{5}{9}$

➢ Solve by **Completing the Square**.

11. $4x^2 - 4x + 3 = 0$

$x^2 - 4x + 12 = 0$

$x^2 - 4x + 4 = -12 + 4$

$\sqrt{(x-2)^2} = \sqrt{-8}$

$x - 2 = \pm\sqrt{-8}$

$x - 2 = \pm 2i\sqrt{2}$

$x = \frac{2 \pm 2i\sqrt{2}}{2}$

$x = 1 \pm i\sqrt{2}$

Solve by **Quadratic Formula**.

12. $2x^2 + 6x = -3$

$2x^2 + 6x + 3 = 0$

$\frac{(-6) \pm \sqrt{(6)^2 - 4(2)(3)}}{2(2)}$

$\frac{-6 \pm \sqrt{12}}{4}$

$\frac{-6 \pm 2\sqrt{3}}{4}$

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

➢ Solve each quadratic equation by the best method: **Factoring, Completing the Square or the Quadratic Formula**

13. $9x^2 - 6x - 11 = 0$

$\frac{(-6) \pm \sqrt{(-6)^2 - 4(9)(-11)}}{2(9)}$

$\frac{6 \pm \sqrt{432}}{18}$

$\frac{6 \pm 12\sqrt{3}}{18}$

$x = \frac{1 \pm 2\sqrt{3}}{3}$

16. $7x^2 - 5x = 0$ or use quadratic equation

$x(7x - 5) = 0$

$x = 0 \quad 7x - 5 = 0$

$x = 0 \quad x = 5/7$

14. $8x^2 + 5 = -6x$

$8x^2 + 6x + 5 = 0$

$\frac{-(6) \pm \sqrt{(6)^2 - 4(8)(5)}}{2(8)}$

$\frac{-6 \pm \sqrt{-124}}{16}$

$\frac{-6 \pm 2i\sqrt{31}}{16}$

$\frac{-3 \pm i\sqrt{31}}{8}$

17. $3x^2 - 6x + 3 = 0$ or use quadratic equation

$x^2 - 6x + 9 = 0$

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

$x - 3 = 0$

$x = 3/3 \quad x = 1$

15. $x^2 + 5x = 6$

$x^2 + 5x - 6$

$(x+6)(x-1) = 0$

$x = -6 \quad x = 1$

or use quad. formula

18. $4x^2 + 4x - 8 = 1$
 $-1 \quad -1$

$4x^2 + 4x - 9 = 0$

$\frac{-(4) \pm \sqrt{(4)^2 - 4(4)(-9)}}{2(4)}$

$\frac{-4 \pm \sqrt{160}}{8}$

$\frac{-4 \pm 4\sqrt{10}}{8}$

$x = \frac{-1 \pm \sqrt{10}}{2}$

➢ Quadratic Systems – Solve by substitution.

19. $y = x^2 + 3$ put in y_1
$y = 4x$ put in y_2

(1,4) (3,12)

2nd, calc, intersect

$x = 1$ $\quad x = 3$

$4x = x^2 + 3$

$y = 4(1)$ $\quad y = 4(3)$

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

$y = 4$ $\quad y = 12$

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

(1,4) (3,12)

20. $y = 3x^2 - 12x + 1$
$y = -2x - 7$

$-2x - 7 = 3x^2 - 12x + 1$

$+2x + 7 \quad +2x \quad +7$

$0 = 3x^2 - 10x + 8$

$0 = x^2 - 10x + 24$

$0 = (x-6)(x-4)$

$\frac{3}{3} \quad \frac{-3}{3}$

$0 = (x-2)(3x-4)$

$x = 2 \quad x = 4/3$ or $1.\overline{3}$

$y = -2(2) - 7 \quad y = -2(4/3) - 7$

$y = -11 \quad y = -29/3$ or $-9.\overline{6}$

(2,-11) $\quad (4/3, -29/3)$

$(1.\overline{3}, -9.\overline{6}), (2, -11)$

Graphing Quadratic Inequalities

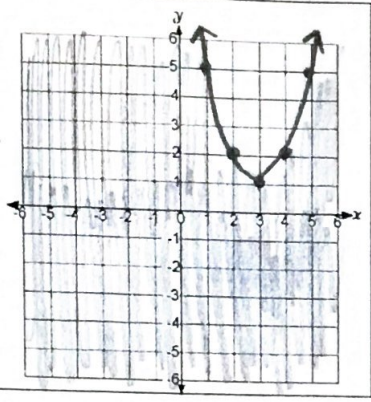
I will grade the darkest portion as your final answer...

21. $y \leq x^2 - 6x + 10$

use calc, table to find important points

Solid

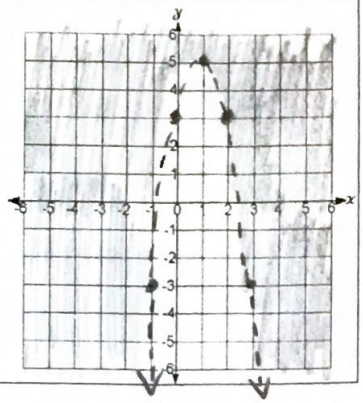
Below



22. $y > -2(x-1)^2 + 5$

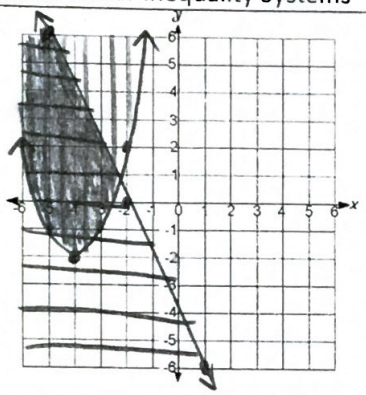
Dotted

Above

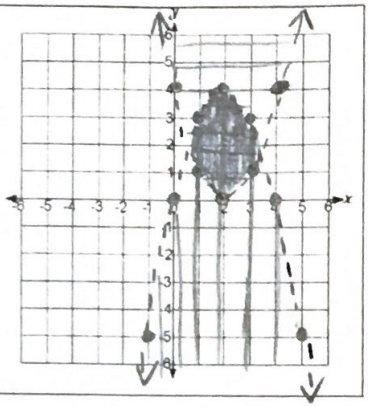


Graphing Quadratic and Linear Inequality Systems

23. Solid, Above
$y \geq x^2 + 8x + 14$
$y \leq -2x - 4$
Solid, Below



24. Dotted, Below
$y < -(x-2)^2 + 4$
$y > (x-2)^2$
Dotted, Above



Solve each Quadratic Inequality. Write your solution in interval notation.

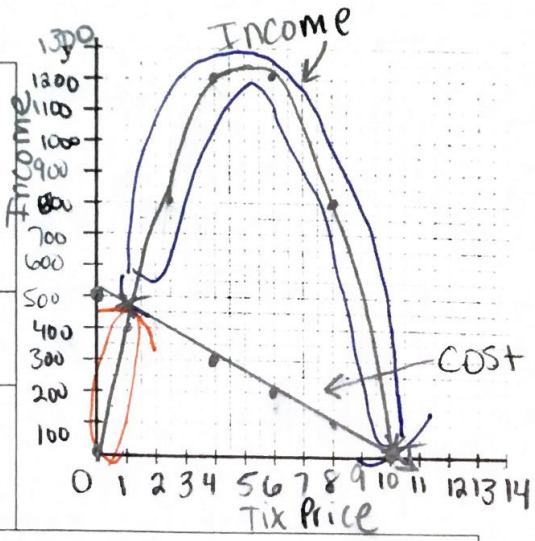
25. $(x-5)(x-2) \leq 0$ in between
$x=5 \quad x=2$
$[2,5]$

26. $x^2 - 12x + 32 > -3$ outside
$x^2 - 12x + 35 \geq 0$
$(x-7)(x-5) \geq 0$
$x=7 \quad x=5$
$(-\infty, 5] \cup [7, \infty)$

27. $x^2 - 64 < 0$ in between
$(x-8)(x+8) < 0$
$x = 8, -8$
$(-8, 8)$

Application of Quadratic and Linear Inequalities

28. Each year the 'Rock the Vote' committee organizes a public rally. Based on previous years, the organizers decided that the income from ticket sales, $I(t)$, is related to ticket price (t) by the equation $\boldsymbol{I(t) = -50t^2 + 500t}$. Cost, $C(t)$, of operating the public event is also related to ticket price (t) by the equation $\boldsymbol{C(t) = -50t + 500}$.



A) What ticket price would generate the maximum income? Where is this shown on the graph? Calc max of parabola $x = 5$

B) For what ticket price would the operating cost be equal to the income from ticket sales? * Calc, intersect
(1,450) (10,0) at $x = 1$ and $= 10$

C) Write and solve an inequality to show where the operating cost is greater than the income from ticket sales.
$[0,1) \cup (10, \infty)$

D) Write and solve an inequality to show where the income from ticket sales is greater than the operating cost.
$(1,10)$

$-50t^2 + 500t = -50t + 500$
$+500 \quad +50t \quad -500$
$-50t^2 + 550t - 500 = 0$

$$\frac{-(550) \pm \sqrt{(550)^2 - 4(-50)(-500)}}{2(-50)}$$

$$\frac{-550 \pm 450}{-100}$$

$$\frac{-550-450}{-100} = 10$$

$$\frac{-550+450}{-100} = 1$$

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