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

Name: _____ Pd: _____
Date: _____

➢ 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. $4x^2 - 4x + 3 = 0$

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

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

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

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

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

$x = \frac{2 \pm 2i\sqrt{2}}{4}$

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

Solve by **Quadratic Formula**.

12. $2x^2 + 6x = -3$ $2x^2+6x+3=0$

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

$\frac{-6 \pm \sqrt{12}}{4}$ $x = \frac{-3 \pm \sqrt{3}}{2}$

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

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

$\frac{(-6) \pm \sqrt{(-6)^2 - 4(9)(-11)}}{2(9)}$ $\frac{6 \pm 12\sqrt{3}}{18}$

$\frac{6 \pm \sqrt{432}}{18}$ $x = \frac{1 \pm 2\sqrt{3}}{3}$

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

$x(7x - 5) = 0$

$x = 0$ $7x - 5 = 0$

$x = 0$ $x = 5/7$

14. $8x^2 + 5 = -6x$ $8x^2+6x+5=0$

$\frac{-(6) \pm \sqrt{(6)^2 - 4(8)(5)}}{2(8)}$ $\frac{-6 \pm 2i\sqrt{31}}{16}$

$\frac{-6 \pm \sqrt{-124}}{16}$ $\frac{-3 \pm i\sqrt{31}}{8}$

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

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

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

$x - 3 = 0$

$x = 3/3$ $x = 1$

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

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

$x = -6$ $x = 1$

or use quad. formula

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

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

$\frac{-(4) \pm \sqrt{(4)^2 - 4(4)(-9)}}{2(4)}$ $\frac{-4 \pm 4\sqrt{10}}{8}$

$\frac{-4 \pm \sqrt{160}}{8}$ $x = \frac{-1 \pm \sqrt{10}}{2}$

➢ Quadratic Systems – Solve by substitution.

19. $y = x^2 + 3$ put in y1 2nd, calc, intersect

$y = 4x$ put in y2

(1,4) (3,12)

$4x = x^2 + 3$

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

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

$x = 1$ $x = 3$

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

$y = 4$ $y = 12$

(1,4) (3,12)

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

$y = -2x - 7$

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

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

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

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

$0 = \frac{(x-6)(x-4)}{3}$

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

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

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

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

(2,-11) $(4/3, -29/3)$ or $(1.\overline{3}, -9.\overline{6})$

(2,-11)

Graphing Quadratic Inequalities

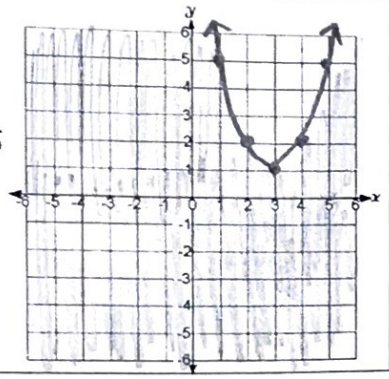
I will grade the darkest portion as your final answer...

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

use calc, table to find important points

Solid

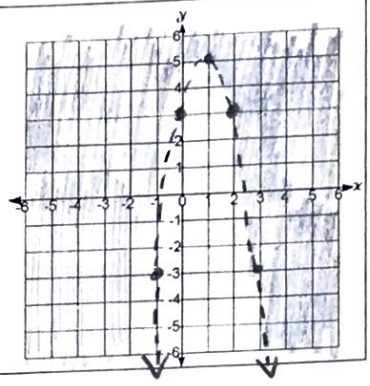
Below



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

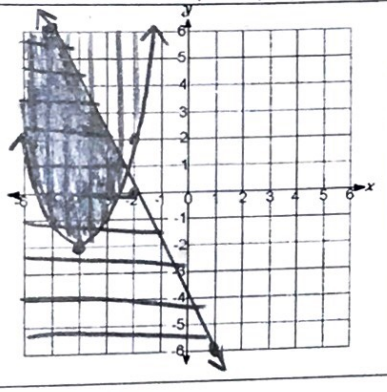
Dotted

Above

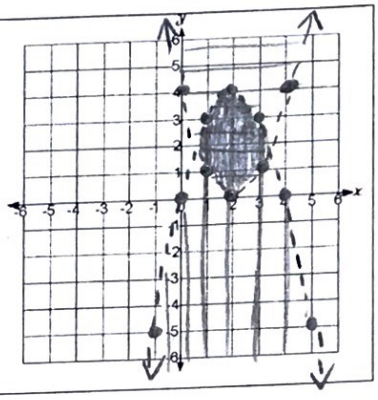


Graphing Quadratic and Linear Inequality Systems

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.

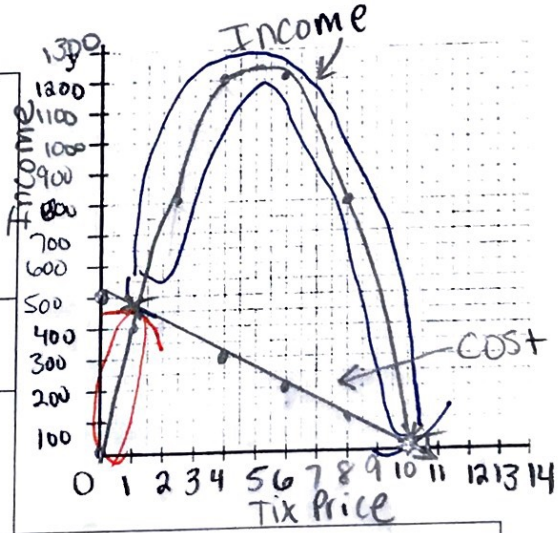
25. $(x-5)(x-2) \leq 0$ in between
$x=5 \quad x=2$
$[2,5]$

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 $I(t) = -50t^2 + 500t$. Cost, $C(t)$, of operating the public event is also related to ticket price (t) by the equation $C(t) = -50t + 500$.



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.
$(1,10)$

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

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

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

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

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

pg. 28

13) Express using exponents : $\sqrt{x}$ $= x^{1/2}$

14) Express using exponents: $\sqrt[3]{y^2}$ $= 4y^{2/3}$

15) Express using exponents: $\frac{1}{\sqrt[4]{8x^2y^3}} = 8^{-1/4}x^{-2/4}y^{-3/4}$
$= 8^{-1/4}x^{-1/2}y^{-3/4}$

16) Express using radicals: $x^{-1/2} = \frac{1}{\sqrt{x}}$

17) Express using radicals: $(4x)^{4/9} = \sqrt[9]{(4x)^4}$ $= \sqrt[9]{256x^4}$

18) Express using radicals: $3x^{2/3} = 3\sqrt[3]{x^2}$

19) Given $-\frac{4}{x-3}+4$ identify the following

Transformations: Reflect x-axis, Right 3, up 4, Stretch by 4

Horizontal Asymptote: $y = 4$

Vertical Asymptote: $x = 3$