Algebra 2 | **Final Exam Review: Chapter 7** | **Mrs. Dunphy**

Name: Key

Your score: /13

Sections 7-1 & 7-2

Solve by ***completing the square***.

1. $y^2+4y+5=0$

$y^2+4y+4=-5+4$

$(y+2)^2=-1$

$\sqrt{(y+2)^2}=\sqrt{-1}$

$y+2=\pm i$

$y=-2\pm i$

$(\frac{4}{2})^2=4$

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

$3x^2+4x+\_=-3+\_$

$x^2+\frac{4}{3}x+\frac{4}{9}=-1+\frac{4}{9}$

$(x+\frac{2}{3})^2=\frac{-5}{9}$

$x+\frac{2}{3}=\sqrt{\frac{-5}{9}}$

$x=-\frac{2}{3}\pm\frac{i\sqrt{5}}{3}$

$(\frac{4}{3}\cdot\frac{1}{2})^2=(\frac{2}{3})^2=\frac{4}{9}$

Solve using the ***quadratic formula***.

3. $2n^2+3n=1$

$2n^2+3n-1=0$ $\quad a=2\ \ b=3\ \ c=-1$

$\frac{-3\pm\sqrt{9-(4\cdot2\cdot-1)}}{4}=\frac{-3\pm\sqrt{9+8}}{4}$

$\frac{-3\pm\sqrt{17}}{4}$

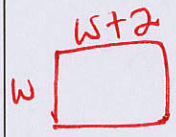
4. $2c(c+2)=-5$

$2c^2+4c+5=0$ $\quad a=2\ \ b=4\ \ c=5$

$\frac{-4\pm\sqrt{16-(4\cdot2\cdot5)}}{4}=\frac{-4\pm\sqrt{-24}}{4}=\frac{-4\pm2i\sqrt{6}}{4}$

$\frac{-4\pm2i\sqrt{6}}{4}=\frac{-2\pm i\sqrt{6}}{2}$

5. The length of a rectangle is 2 cm more than the width. If its area is 5 cm², what are its dimensions? Express your answer in simplified radical form.



$w(w+2)=5$

$w^2+2w-5=0$

$w=\frac{-2\pm\sqrt{4-(4\cdot1\cdot-5)}}{2}=\frac{-2\pm\sqrt{24}}{2}=\frac{-2\pm2\sqrt{6}}{2}$

$-1+\sqrt{6}$

*can't be negative

Section 7-4

Solve each equation that is in quadratic form. Hint: Let y = (something)^2, solve for y, then solve for x.

6. $x-3\sqrt{x}-10=0$ $\quad y=\sqrt{x}$

$(\sqrt{x})^2-3(\sqrt{x})-10=0$

$y^2-3y-10=0$

$(y-5)(y+2)=0$

$y=5$ $\quad y=-2$

$\sqrt{x}=5$ $\quad \sqrt{x}=-2$ not possible

$x=25$

$\{25\}$

7. $x^4-6x^2+5=0$ $\quad y=x^2$

$y^2-6y+5=0$

$(y-1)(y-5)=0$

$y=1$ $\quad y=5$

$x^2=1$ $\quad x^2=5$

$x=\pm\sqrt{1}$ $\quad x=\pm\sqrt{5}$

$x=\pm1$ $\quad \{\pm\sqrt{5},\pm1\}$

8. $(x+4)^2+2(x+4)-15=0$

$y=(x+4)$

$y^2+2y-15=0$

$(y+5)(y-3)=0$

$y=-5$ $\quad y=3$

$x+4=-5$ $\quad x+4=3$

$x=-9$ $\quad x=-1$

$\{-9,-1\}$

Sections 7-5 & 7-6

For each parabolic equation, determine the vertex, axis of symmetry, and whether the parabola opens up or down. Graph the parabola accurately. Find the x-intercepts (hint: use the method of square roots).

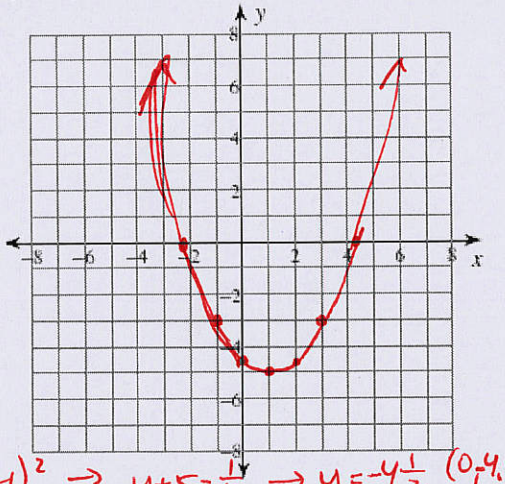
9. $y+5=\frac{1}{2}(x-1)^2$

$y-(-5)$

Vertex: $(1,-5)$

Axis of symmetry: $x=1$

Opens: up



y-intercept: $y+5=\frac{1}{2}(0-1)^2 \rightarrow y+5=\frac{1}{2} \rightarrow y=-4\frac{1}{2}$ $(0,-4.5)$

x-intercepts: $(y=0)$

$5=\frac{1}{2}(x-1)^2 \rightarrow (1+\sqrt{10},0)(1-\sqrt{10},0)$

$10=(x-1)^2$

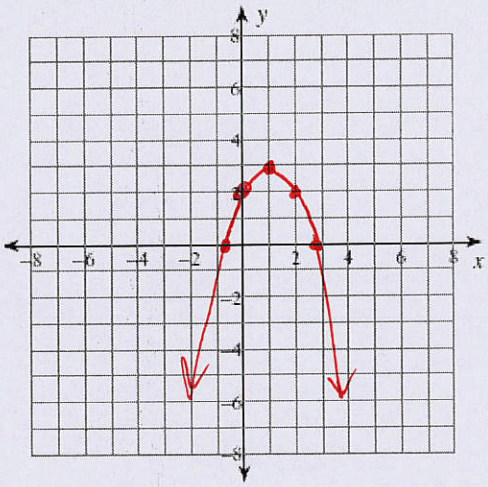
$\pm\sqrt{10}=x-1$ $\quad x=1\pm\sqrt{10} \approx 4.16, -2.16$

10. $y-3=-(x-1)^2$

Vertex: $(1,3)$

Axis of symmetry: $x=1$

Opens: down



y-intercept: $y-3=-1$, $y=2$

x-intercepts:

$-3=-(x-1)^2$ $\quad (1+\sqrt{3},0)(1-\sqrt{3},0)$

$3=(x-1)^2$

$\pm\sqrt{3}=x-1$ $\quad x=1\pm\sqrt{3} \approx 2.73, -0.73$

11. Find an equation of a parabola in vertex form having vertex (3, 5) and passing through the point (4, 7).

h k $\quad y-k=a(x-h)^2$

x y

$y-5=a(x-3)^2$

$7-5=a(4-3)^2$

$2=a$

$y-5=2(x-3)^2$

OR $y=2(x-3)^2+5$

12. Convert $y=x^2-4x+5$ into vertex form by completing the square.

$(\frac{4}{2})^2$

$y-5=x^2-4x$

$y-5+4=x^2-4x+4$

$y-1=(x-2)^2$

OR $y=(x-2)^2+1$

13. Find the vertex, axis of symmetry, and minimum or maximum of the function $f(x)=x^2-4x+4$.

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

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

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

$y=(x-2)^2$

Vertex: $(2,0)$

Axis of symmetry: $x=2$

Min or Max:

opens up $\therefore$ min

Write any questions you need to ask during the next class period in this space.

I will answer these questions in class :)