3. $x^2 + 12x + 43 = 0$ $-43 \quad -43$ $x^2+12x+36 = -43+36$ $(x+6)^2 = -7$ $x+6 = \pm\sqrt{-7}$ $x+6 = \pm i\sqrt{7}$ $-6 \quad -6$ $x = -6 \pm i\sqrt{7}$	4. $3x^2 - 6x - 45 = 0$

1) **BEGIN** with $ax^2 + bx + c = 0$ and **MULTIPLY** "a" to "c"
2) **REWRITE** $x^2 + bx = -c \cdot a$
3) $x^2 + bx +$ _____ $= -c \cdot a +$ _____
4) **COMPLETE THE SQUARE** by taking half of b; square it and ADD IT TO BOTH SIDES of the equation in the blanks.
5) **FACTOR** the perfect square trinomial.
6) Take the **SQUARE ROOT** of both sides. Don't forget to include a $\pm$ to create 2 solutions.
7) **SOLVE** both equations. **SIMPLIFY** all irrational and complex solutions.
8) **DIVIDE** by "a" and **REDUCE** all final solutions.

5. $3x^2 + 10x - 8 = 0$ $+8 \quad +8$ $3x^2+10x = 8$	6. $4x^2 - 8x + 3 = 0$ $x^2-8x+12=0$ $(x-2)(x-6)$ $(x-\frac{4}{2})(x-\frac{6}{4})$ $(x-\frac{1}{2})(x-\frac{3}{2})$ $(2x-1)(2x-3)$ $x=1/2 \quad x=3/2$
7. $4x^2 - .16x + 71 = 0$	8. $3x^2 + 6x - 4 = 0$

pg. 13 #5 $3x^2+10x-8=0$

$+8 \quad +8$

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

$3\left(x^2+\frac{10}{3}x+\frac{100}{36}\right)=8+3\cdot\frac{100}{36}$

$\frac{10}{3}\cdot\frac{1}{2}=\left(\frac{10}{6}\right)^2=\frac{100}{36}$

$\frac{3\left(x+\frac{10}{6}\right)^2}{3}=\frac{49}{3}\cdot\frac{1}{3}$

$\sqrt{\left(x+\frac{10}{6}\right)^2}=\sqrt{\frac{49}{9}}$

$x+\frac{10}{6}=\pm\frac{7}{3}$

$-\frac{10}{6} \qquad -\frac{10}{6}$

$x=\frac{7}{3}-\frac{10}{6} \quad \Big| \quad -\frac{7}{3}-\frac{10}{6}$

$2/3 \qquad -4$

$3x^2+10x-8$

$x^2+10x-24$

$(x+12)(x-2)$

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

$(x+4)(3x-2)$

$x=-4 \quad x=2/3$

Math 2
Unit 3 – Rational Exponents and Solving Quadratics
Lesson 4 → Completing the Square HOMEWORK

Name_____
Date_____ Pd_____

SOLVE BY COMPLETING THE SQUARE:

1. $x^2 + 14x - 51 = 0$

$+51 \quad +51$

$x^2 + 14x + 49 = 51 + 49$

$\sqrt{(x+7)^2} = \sqrt{100}$

$x + 7 = \pm 10$

$x + 7 = +10 \quad x + 7 = -10$

$-7 \quad -7 \quad -7 \quad -7$

$x = 3 \quad x = -17$

2. $x^2 - 12x + 23 = 0$

$-23 \quad -23$

$x^2 - 12x + 36 = -23 + 36$

$\sqrt{(x-6)^2} = \sqrt{13}$

$x - 6 = \pm\sqrt{13}$

$x = 6 \pm \sqrt{13}$

$6 + \sqrt{13}$

$6 - \sqrt{13}$

3. $x^2 - 4x + 6 = 0$

$-6 \quad -6$

$x^2 - 4x + 4 = -6 + 4$

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

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

$+2 \quad +2$

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

4. $x^2 - 10x + 18 = 0$

$-18 \quad -18$

$x^2 - 10x + 25 = -18 + 25$

$\sqrt{(x-5)^2} = \sqrt{7}$

$x - 5 = \pm\sqrt{7}$

$+5 \quad +5$

$x = 5 \pm \sqrt{7}$

$x = 5 \pm \sqrt{7}$

5. $x^2 + 18x - 40 = 0$

6. $4x^2 + 4x + 36 = 0$

$-36 \quad -36$

$4x^2 + 4x = -36$

$4(x^2 + x + \frac{1}{4}) = -36 + 4 \cdot \frac{1}{4}$

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

$\frac{4(x+\frac{1}{2})^2}{4} = \frac{-35}{4}$

$\sqrt{(x+\frac{1}{2})^2} = \sqrt{\frac{-35}{4}}$

$x + \frac{1}{2} = \pm i\sqrt{\frac{35}{4}}$

$x = -\frac{1}{2} \pm i\sqrt{\frac{35}{4}}$

7. $x^2 + 2x + 20 = 0$

$-20 \quad -20$

$x^2 + 2x + 1 = -20 + 1$

$\sqrt{(x+1)^2} = \sqrt{-19}$

$x + 1 = \pm i\sqrt{19}$

$-1 \quad -1$

$x = -1 \pm i\sqrt{19}$

8. $3x^2 + 12x + 21 = 0$

$-21 \quad -21$

$3x^2 + 12x = -21$

calc

$3(x^2 + 4x + 4) = -21 + 3 \cdot 4$

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

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

$x + 2 = \pm i\sqrt{3}$