Name:_____   Date:_____

Pre Calculus 11 Ch3/4 HW: Lesson 7 Completing the Square

1. What is a perfect trinomial? Explain using your own words? How do you tell if a trinomial is a perfect trinomial?

2. Which of the following are perfect trinomials? Indicate YES or NO I(If not, explain why If yes, factor it.

a) $y = x^2 + 12x + 36$	b) $y = x^2 + 10x - 25$	c) $y = x^2 - 14x + 49$
d) $y = x^2 - 20x - 100$	e) $y = x^2 + 22x + 121$	f) $y = x^2 - 40x + 400$
g) $y = 4x^2 - 4x + 1$	h) $y = 4x^2 - 9$	i) $y = 25x^2 - 20x + 4$

3. What does it mean to complete the square? Explain:

4. Indicate what value should be added to the trinomial so that the equation could be a perfect trinomial:

a) $x^2 + (?) + 9$	b) $x^2 + 8x + (?)$
c) $(?) - 2x + 1$	d) $x^2 - (?) + 81$
e) $x^2 - 15x + (?)$	f) $x^2 + 17x + (?)$
g) $4x^2 + 4x + (?)$	h) $9x^2 - (?) + 1$

5. What are the first two steps in the process of completing the square?

6. What is $12 \div \left(-\dfrac{1}{2} \right)$? What happens when you divide a value by a fraction?

7. Convert each equation in to vertex form: $y = a(x - p)^2 + q$ by completing the square. Show all your steps:

a) $y = x^2 + 4x - 20$	b) $y = x^2 - 8x - 20$
Equation :	*Equation* :
c) $y = -x^2 - 14x - 15$	d) $y = 4x^2 + 20x - 12$
Equation :	*Equation* :

e) $y = 2x(x-5)$

Equation :

f) $y = 3x^2 + 6x + 10$

Equation :

g) $y = -2x^2 - 15x + 100$

Equation :

h) $y = -3x^2 + 18x + 50$

Equation :

e) $y = -\dfrac{1}{2}x^2 + 14x + 100$

Equation :

f) $y = \dfrac{1}{2}x^2 + 8x - 30$

Equation :

8. Given a quadratic function in the form of $y = a(x-p)^2 + q$:

    a. If $a > 0$ and $q > 0$, then the function will not have any roots: TRUE or FALLSE (Explain)

    b. If $a < 0$ and $q > 0$, then the function will have only one root: TRUE or FALLSE (Explain)

    c. If $a < 0$ and $p < 0$, then the function will at least one root: TRUE or FALLSE (Explain)

    d. If $a \times q < 0$ then the function will have two roots: TRUE or FALLSE (Explain)

9. 3 tried to convert a quadratic function from general form to vertex form by completing the square. Review each step and indicate if there are any errors in the process:

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a) student #1

$step\ 1:\ y = 3x^2 - 6x + 10$

$step\ 2:\ y = (3x^2 - 6x) + 10$

$step\ 3:\ y = 3x(x-2) + 10$

$step\ 4:\ y = 3(x-2)^2 + 10$

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b) Student #2

$Stept\ 1: y = -2x^2 + 20x - 3$

$Stept\ 2: y = (-2x^2 + 20x) - 3$

$Stept\ 3: y = -2(x^2 + 10x) - 3$

$Stept\ 4: y = -2(x^2 + 10x + 25 - 25) - 3$

$Stept\ 5: y = -2(x+5)^2 + 50 - 3$

$Stept\ 6: y = -2(x+5)^2 + 47$

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c) Student #3

$Stept\ 1: y = -\dfrac{1}{2}x^2 + 4x + 5$

$Stept\ 2: y = \left(-\dfrac{1}{2}x^2 + 4x\right) + 5$

$Stept\ 3: y = -\dfrac{1}{2}(x^2 - 2x) + 5$

$Stept\ 4: y = -\dfrac{1}{2}(x^2 - 2x + 1 - 1) + 5$

$Stept\ 5: y = -\dfrac{1}{2}(x-1)^2 + 1 + 5$

$Stept\ 6: y = -\dfrac{1}{2}(x-1)^2 + 6$

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d) Student #4

$Stept\ 1: y = \dfrac{2}{3}x^2 + 8x + 10$

$Stept\ 2: y = \left(\dfrac{2}{3}x^2 + 8x\right) + 10$

$Stept\ 3: y = \dfrac{2}{3}(x^2 + 12x) + 10$

$Stept\ 4: y = \dfrac{2}{3}(x^2 + 12x + 36 - 36) + 10$

$Stept\ 5: y = \dfrac{2}{3}(x+6)^2 + 24 + 10$

$Stept\ 6: y = \dfrac{2}{3}(x+6)^2 + 34$

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