Name: _____ Date: _____ Per: _____

LC Math 1 Adv – *Re-Writing Standard Form Equations in Vertex Form (LT 10)*

Determine what number "c" must be added to each expression to complete the square, then re-write the trinomial as the square of a binomial.

1. x^2+6x+c

x^2+6x+9

$(x+3)^2$

2. $x^2-10x+c$

$x^2-10x+25$

$(x-5)^2$

3. $x^2+14x+c$

$x^2+14x+49$

$(x+7)^2$

4. x^2-8x+c

$x^2-8x+16$

$(x-4)^2$

Re-write each standard form equation in vertex form.

5. $y=x^2+16x+71$

$y=(x^2+16x+64)+71-64$

$y=(x+8)^2+7$

6. $y=x^2-2x-5$

$y=(x^2-2x+1)-5-1$

$y=(x-1)^2-6$

7. $y=-2x^2-20x-53$

$y=-2(x^2+10x+25)-53+50$

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

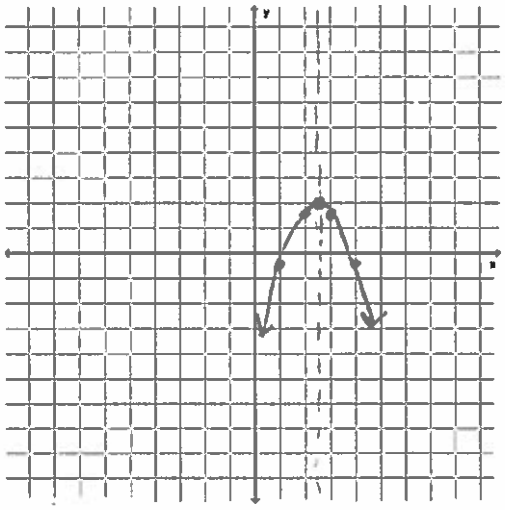
8. $y=3x^2-12x+8$

$y=3(x^2-4x+4)+8-12$

$y=3(x-2)^2-4$

Graph each function below on the coordinate planes provided. Include the vertex, axis of symmetry, and <u>four</u> additional points.

9. $f(x) = -\left(x - \frac{5}{2}\right)^2 + 2$



Vertex: $\left(\frac{5}{2}, 2\right)$

Axis of Symmetry: $x = 5/2$

Additional Points: $(3, 7/4)$

and _____

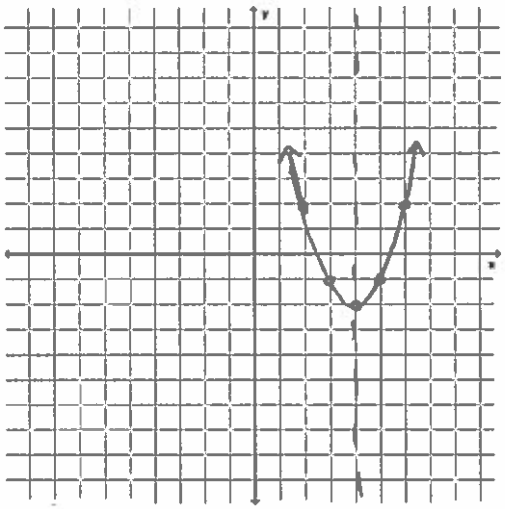
$f(3) = -\left(3 - \frac{5}{2}\right)^2 + 2 = -\frac{1}{4} + 2 = \frac{7}{4}$

$f(4) = -\left(4 - \frac{5}{2}\right)^2 + 2 = -\frac{9}{4} + 2 = -\frac{1}{4}$

10. $f(x) = x^2 - 8x + 14$

$f(x) = (x^2 - 8x + 16) + 14 - 16$

$f(x) = (x - 4)^2 - 2$



Vertex: $(4, -2)$

Axis of Symmetry: $x = 4$

Additional Points: $(5, -1)$

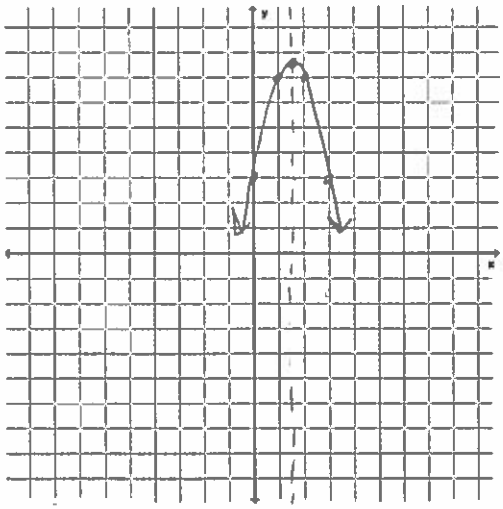
and $(6, 2)$

11. $f(x) = -2x^2 + 6x + 3$

$(-2x^2 + 6x) + 3$

$-2\left(x^2 - 3x + \frac{9}{4}\right) + 3 + \frac{9}{2}$

$-2\left(x - \frac{3}{2}\right)^2 + \frac{15}{2}$



Vertex: $\left(\frac{3}{2}, \frac{15}{2}\right)$

Axis of Symmetry: $x = \frac{3}{2}$

Additional Points: $(2, 7)$ $f(2) = -2\left(\frac{1}{2}\right)^2 + \frac{15}{2} = 7$

and $(3, 3)$ $f(3) = -2\left(\frac{3}{2}\right)^2 + \frac{15}{2} = 3$

$-\frac{9}{2} + \frac{15}{2}$