

Name \_\_\_\_\_ Block \_\_\_\_\_ Date \_\_\_\_\_

**PM11 - Graphing**  $y = ax^2 + bx + c$ 

1. What number must be added to the following binomials to complete the square (ie. to make it into a perfect square trinomial)?

a)  $x^2 - 4x$

b)  $x^2 + 2x$

c)  $x^2 + x$

d)  $x^2 - 8x$

e)  $x^2 + 3x$

f)  $2(x^2 - 6x)$

g)  $4x^2 - 40x$

h)  $2x^2 + 20x$

i)  $-3x^2 + 12x$

2. Change each equation to the form  $y = a(x - p)^2 + q$  by completing the square. For each question, complete the statement: "The maximum/minimum value is \_\_\_ when  $x =$  \_\_\_".

a)  $y = x^2 + 4x + 4$

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

c)  $y = x^2 + 2x - 7$

d)  $y = x^2 - 12x + 30$

e)  $y = -x^2 - 6x + 1$

f)  $y = 2x^2 - 12x + 15$

g)  $y = -3x^2 + 24x - 40$

h)  $y = -2x^2 + 6x - 1$

i)  $y = 3x^2 - 15x + 23$

j)  $y = \frac{1}{3}x^2 - 4x + 14$