

# CHAPTER 6 REVIEW

## Section 1: Completing the Square

1) For each parabola in standard form, find the max/min point by completing the square and finding the vertex.

a)  $y = x^2 + 4x + 5$

The vertex is: \_\_\_\_\_ Is this a max or min point? \_\_\_\_\_

b)  $y = x^2 - 10x + 7$

The vertex is: \_\_\_\_\_ Is this a max or min point? \_\_\_\_\_

c)  $y = x^2 + 2x + 6$

The vertex is: \_\_\_\_\_ Is this a max or min point? \_\_\_\_\_

**d)**  $y = -x^2 + 4x - 4$

The vertex is: \_\_\_\_\_

Is this a max or min point?: \_\_\_\_\_

**e)**  $y = 3x^2 - 30x + 73$

The vertex is: \_\_\_\_\_

Is this a max or min point?: \_\_\_\_\_

**f)**  $y = 2x^2 - 8x - 7$

The vertex is: \_\_\_\_\_

Is this a max or min point?: \_\_\_\_\_

2) What is the vertex, direction of opening, and number of roots (x-intercepts) for each of the following quadratic equations?

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

vertex =

direction of opening =

number of roots =

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

vertex =

direction of opening =

number of roots =

c)  $y = \frac{1}{2}(x + 4)^2$

vertex =

direction of opening =

number of roots =

### Section 2: Solving By Factoring

3) Solve each of the following quadratic equations by factoring:

a)  $x^2 + 4x - 21 = 0$

b)  $-x^2 + 5x + 6 = 0$  (factor out the negative first!)

c)  $x^2 + 5x = -4$  (set equal to 0)

d)  $x^2 + x - 6 = 0$

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

f)  $5x^2 - 19x - 4 = 0$

g)  $2x^2 + 5 = -11x$

h)  $4a^2 + 12a = -9$

i)  $-2x^2 - 5x = 2$

**Section 3: Solve Using the Quadratic Formula**

4) Solve each of the following quadratic expressions using the quadratic formula (find the approximate roots):

a)  $x^2 + 7x + 5 = 0$

b)  $3x^2 - 6x - 5 = 0$

c)  $x^2 - 5x = 2$

d)  $0 = -2x^2 + 4x + 7$

e)  $0 = 3x^2 + 6x + 4$

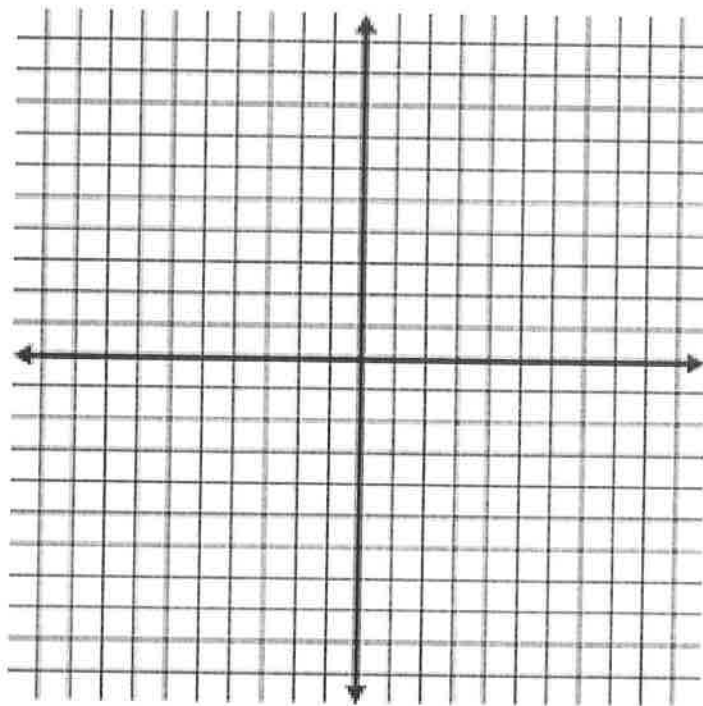
f)  $4x^2 - 12x + 9 = 0$

g)  $16x^2 + 24x - 9 = 0$

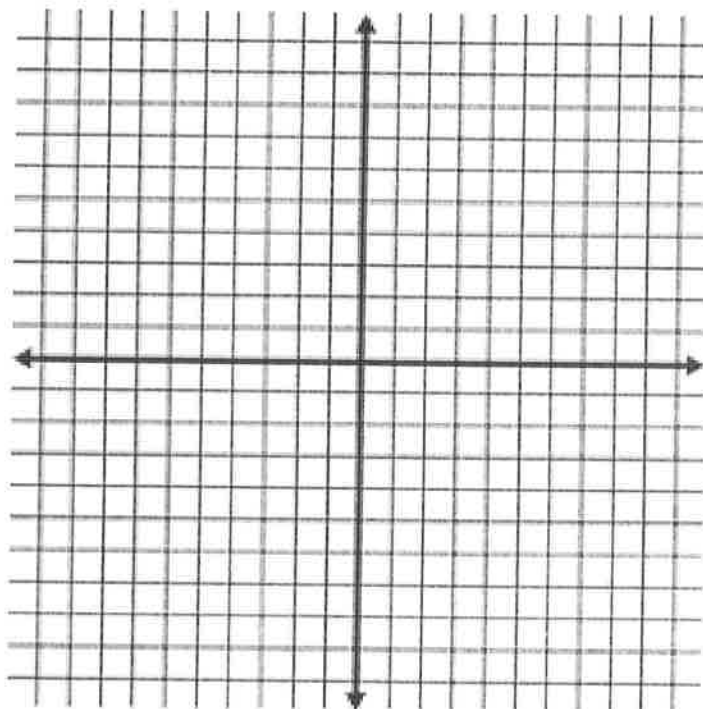
h)  $x^2 - 2x + 3 = 0$

5) Sketch the graph of the following parabolas. Label the vertex and x-intercepts (you must solve using any method, then find the axis of symmetry, then the vertex) (Extra – Pg.316 #7)

a)  $y = x^2 + 8x + 12$



b)  $y = 3x^2 + 12x - 15$

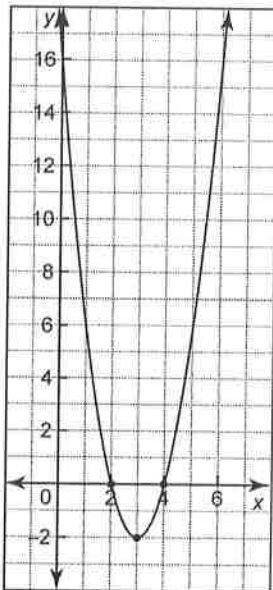




**Section 4: Write the Equation in standard form (Extra – Pg.289#6,7)**

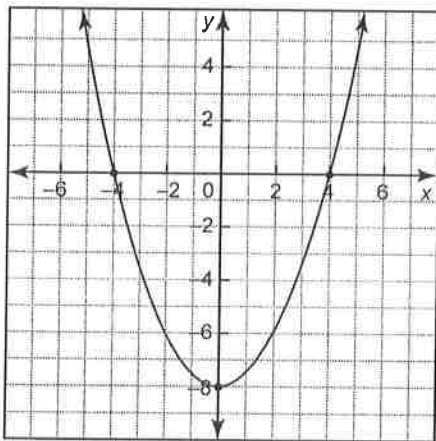
6) Write the equation in standard form for each graph (You will first have to write it in factored form, then expand using FOIL):

a)



The equation in standard form is: \_\_\_\_\_

b)



The equation in standard form is: \_\_\_\_\_

**Section 5: Applications (extra practice Pg. 319#15,16)**

- 7) A toy rocket is launched from a platform that is 2 m off the ground at an initial velocity of 17.4 m/s. The height,  $h$ , in metres, of the rocket  $t$  seconds after it is launched is given by the equation  $h = -4.9t^2 + 17.4t + 2$ .
- When will the rocket land (find the x-intercepts using the quadratic formula)?
  - What is the maximum height (what is the y-coordinate of the vertex)?

Do you want 2 bonus marks on your test? Learn to show the proof of the quadratic formula.