Name _____

5.3 *Investigation:* Graphing Quadratic Functions by Factoring

MATHPOWER™ 10, Ontario Edition, p. 287

- To sketch the graph of a quadratic function,
  - a) find the x-intercepts by factoring the equation in the form $ax^2 + bx + c = 0$
  - b) plot the points where the graph crosses the x-axis, ($y = 0$)
  - c) use symmetry to find the x-coordinate of the vertex
  - d) find the y-coordinate of the vertex by substituting the x-coordinate of the vertex into the equation in the form $y = ax^2 + bx + c$
  - e) draw a smooth curve through the three points

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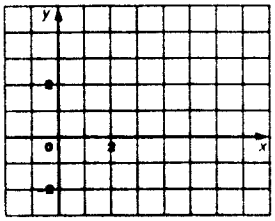
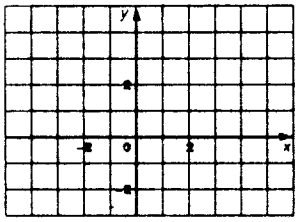
1. Sketch the graphs of the following quadratic functions by locating the x-intercepts, and then finding the coordinates of the vertex.

a) $y = (x - 3)(x - 5)$



b) $y = x^2 - 1$

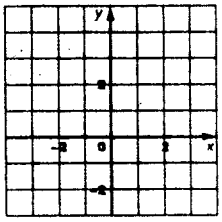


2. Use the x-intercepts to determine the coordinates of the points on the x-axis and th vertex for the graph of each quadratic functio

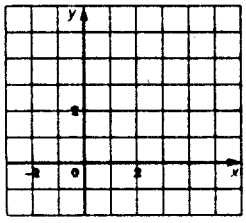
a) $y = (x + 5)(x - 5)$ b) $y = x^2 - 49$

3. Sketch the graphs of the following quadratic functions by factoring to find the x-intercepts, and then deducing the coordinates of the vertex.

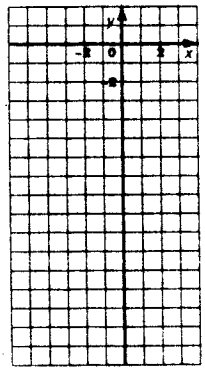
a) $y = x^2 + 2x$



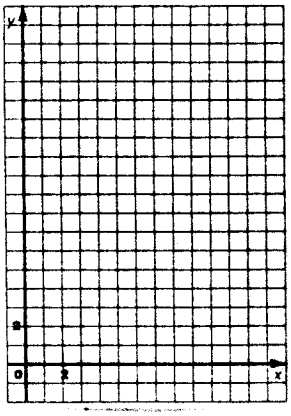
b) $y = x^2 - 7x + 12$



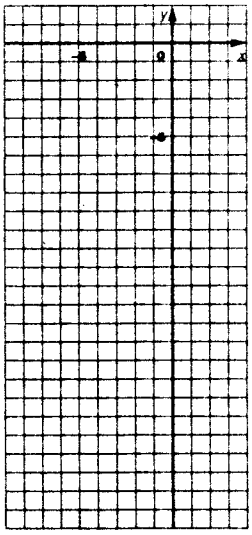
c) $y = x^2 + 4x - 12$



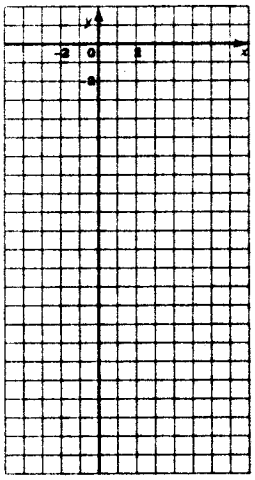
d) $y = 6x - 0.5x^2$



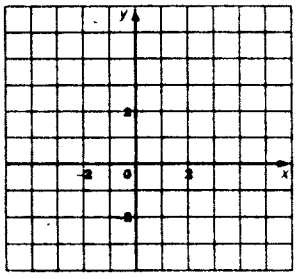
e) $y = x^2 + 4x - 21$



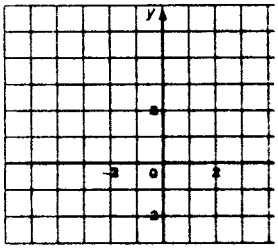
f) $y = x^2 - 3x - 18$



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



h) $y = x^2 + 5x + 6$



4. Write a quadratic equation in factored form with:

a) zeros of -2 and 4 and y-intercept of -4

b) x-intercepts of -9 and -5 and y-intercepts of 8

c) roots of 1 and -3 passing through (2,2)

d) x-intercepts of 0 and $\frac{1}{4}$ passing through (-2,1)

5. If one root is 5, find the value of k and the other root.

a) $x^2 - kx + 40 = 0$

b) $x^2 + kx + 25 = 0$

c) $2x^2 - 13x + k = 0$