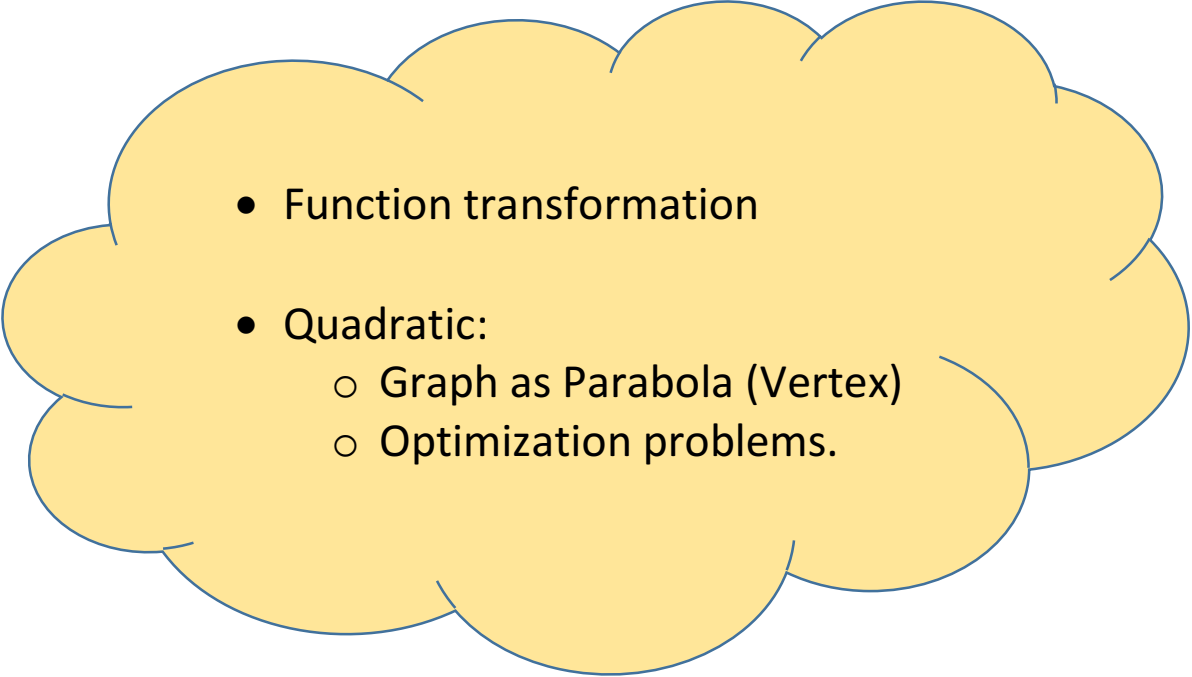


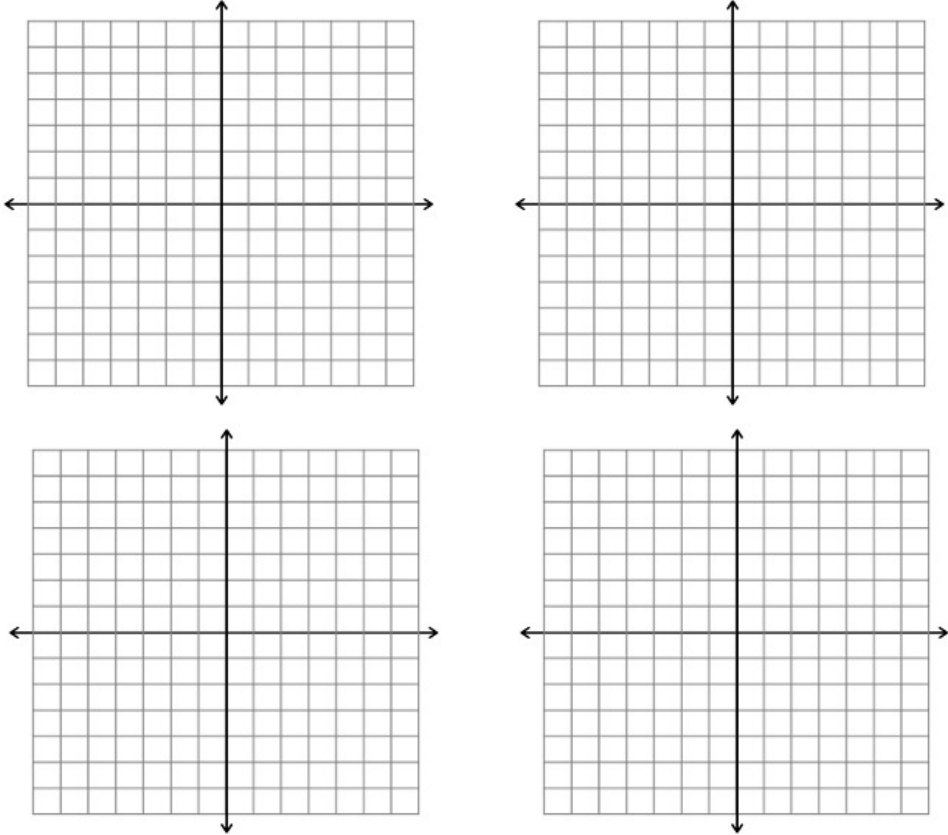
## Unit 9: Quadratic functions and transformations

(Chapter 9, page 382)

Transformative ideas in this unit.

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- Function transformation
  - Quadratic:
    - Graph as Parabola (Vertex)
    - Optimization problems.

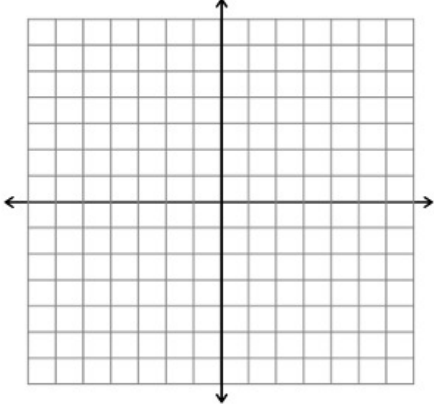
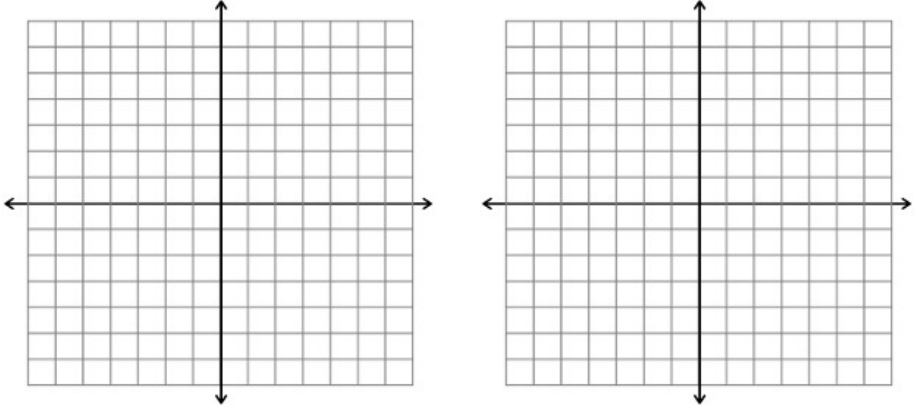
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<input type="checkbox"/>	<b>Graphs of quadratic functions</b> Sections 9-4, 9-5, 9-6 and 9-6	Pages 400 and onward.
<input type="checkbox"/>	Vertex form: $f(x) = a(x - h)^2 + k$ -- Vertex is at _____ -- Impact of 'h' on the graph: _____ -- Impact of 'k' on the graph: _____ -- Impact of 'a' on the graph: _____  ---- Examples:   <p>The examples section contains four empty coordinate grids arranged in a 2x2 grid. Each grid is 10 units wide and 10 units high, with a horizontal x-axis and a vertical y-axis. The axes have arrows at their ends. The origin (0,0) is at the center of each grid.</p>	

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	<p>☐ Need to know to transform from and to each of the forms to any other, and their relations to the graph of the function:</p> <p>1. Standard form <math>f(x) = ax^2 + bx + c</math></p> <p>2. Vertex form <math>f(x) = a(x - h)^2 + k</math></p> <p>3. Factored form <math>f(x) = a(x - x_1)(x - x_2)</math></p> <p>Graph: Vertex, X intercepts, Y intercepts.</p>	
	<p>☐ Solving problems: Maximum Minimum</p> <p>'Fence' problems.</p> <p>-- Arrive at a quadratic expression</p> <p>-- Do NOT solve for 'x'. Just find the vertex → That's the minimum/maximum point.</p> <p>-----</p> <p>---- Example:</p>	<p>Page 409</p>

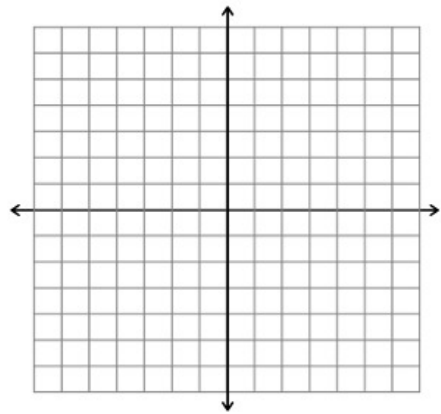
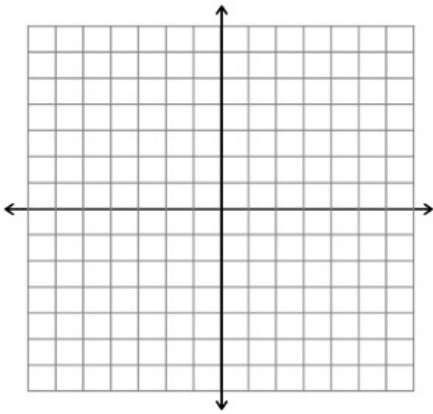
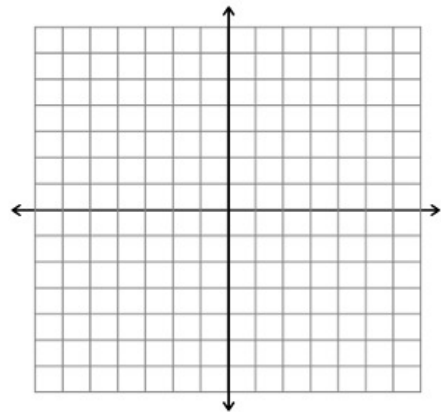
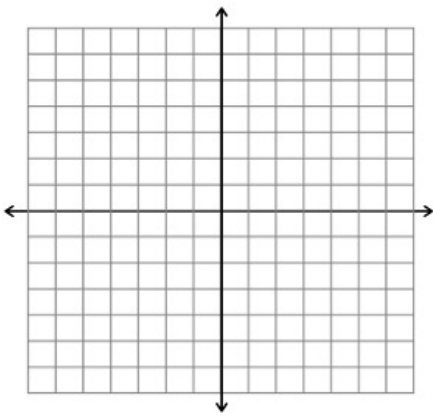
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	<b>Transformations</b>	Chapter 9, 9-1 to 9-3, pages 384-399
<input type="checkbox"/>	We had VERY good packet on this. Most of the information is there.  Will just list the terms here.	
<input type="checkbox"/>	<p>-- Symmetry (We focused with respect to a vertical line. E.g., <math>x=3</math>)</p> <p>-- Odd function -- Even function</p>  <p>-- Parent functions: Linear (<math>x</math>), Quadratic (<math>x^2</math>), Cubic (<math>x^3</math>), Absolute Value (<math> x </math>), Radical (<math>\sqrt{x}</math>), Rational (<math>\frac{1}{x}</math>), Floor (<math>\text{floor}(x)</math> or <math>\text{int}(x)</math>)</p> 	

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- -- Transformations:  $f(x)+3$ ,  $f(x)-3$ ,  $f(x+3)$ ,  $f(x-3)$ ,  $2f(x)$ ,  $1/2 f(x)$ ,  $f(2x)$ ,  $f(x/2)$ ,  $f(-x)$ ,  $-f(x)$
- ( A little bit harder transformation, but worth contemplating:  $f(3x-1)$  )
- Shift/translate :  $f(x-3)$ ,  $f(x) -3$
- Stretch/shrink :  $2f(x)$ ,  $f(2x)$
- Reflection ( $f(-x)$ ,  $-f(x)$ )
- Rigid transformation and non-rigid transformations



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