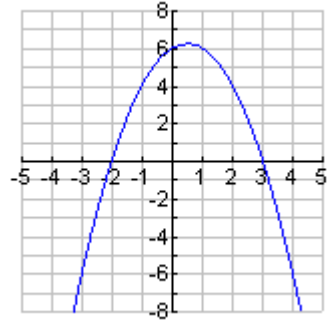
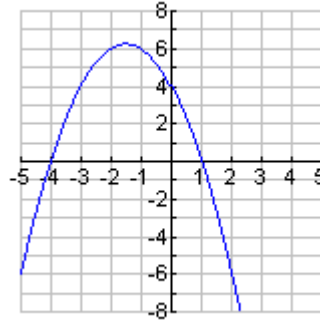
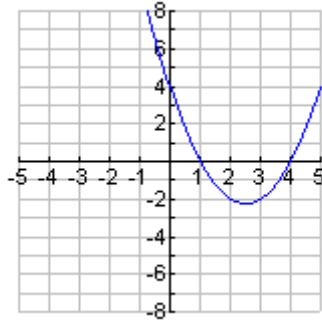


GRAPHING FROM FACTORED FORM

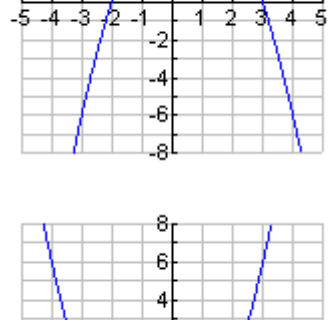
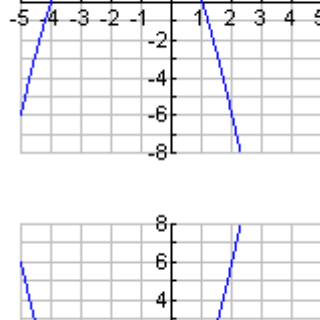
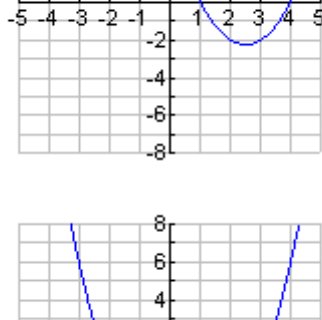
When you are done with this activity, you should be able to graph quadratic equations (in factored form) by hand.

Part A: Using DESMOS as needed, match each equation to its graph.

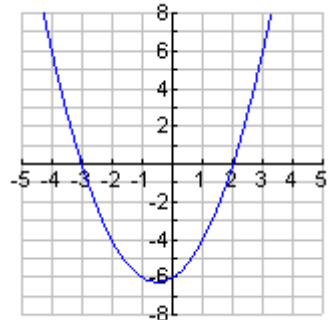
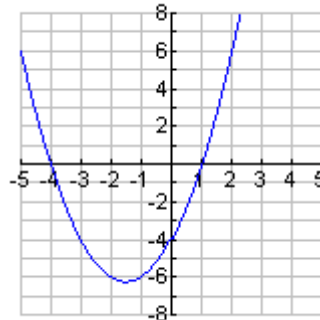
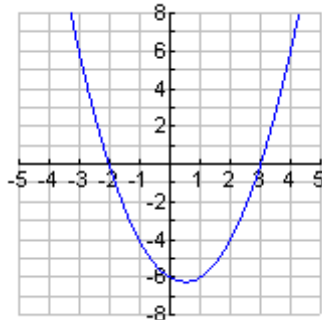
1. $y = -(x+2)(x-3)$



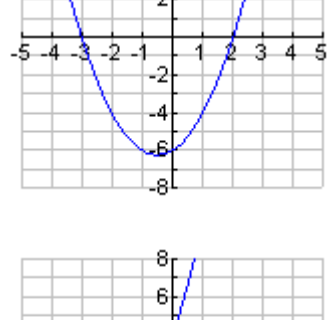
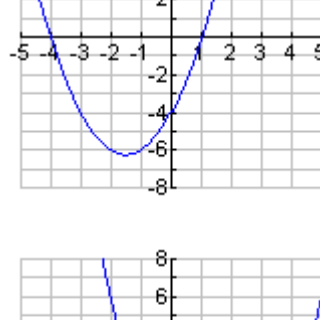
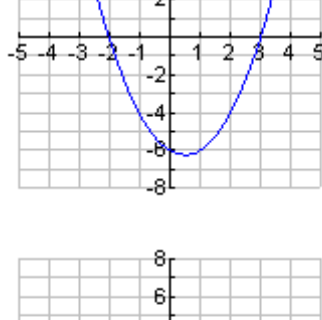
2. $y = (x-2)(x+3)$



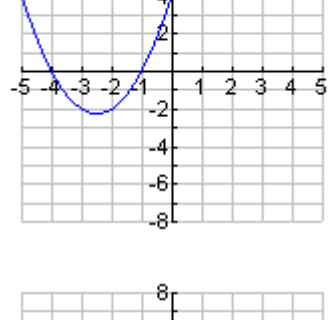
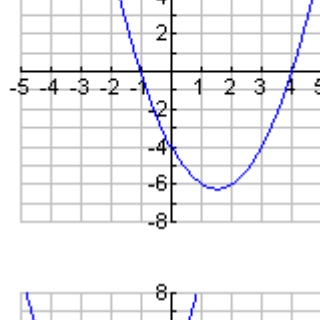
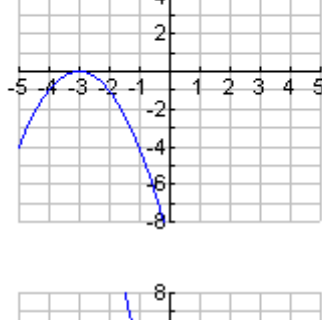
3. $y = (x-3)(x+2)$



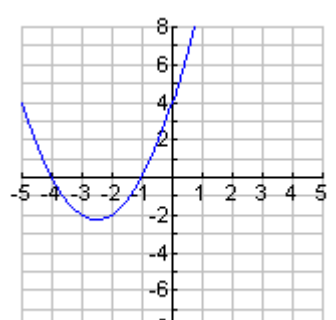
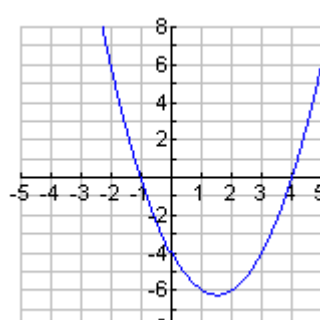
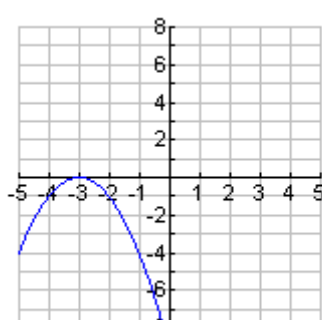
4. $y = (x-4)(x+1)$



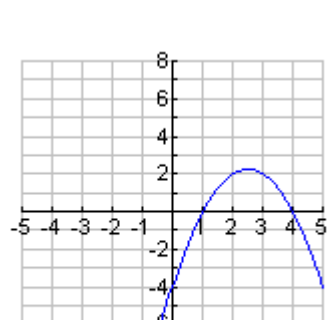
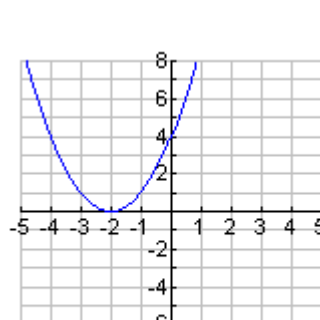
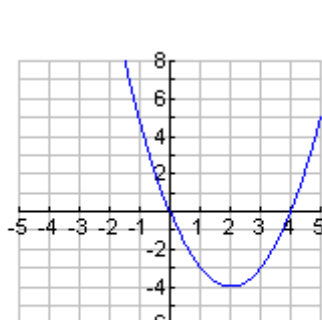
5. $y = (x-1)(x+4)$



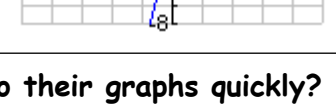
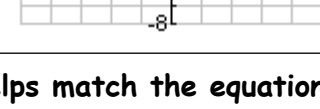
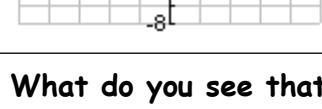
6. $y = -(x-1)(x+4)$



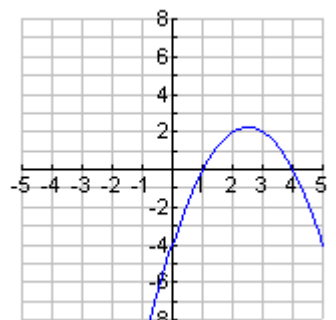
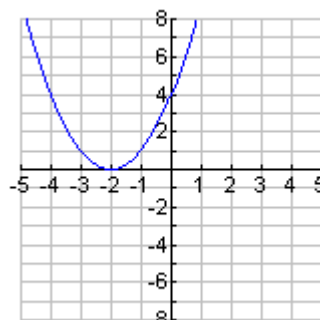
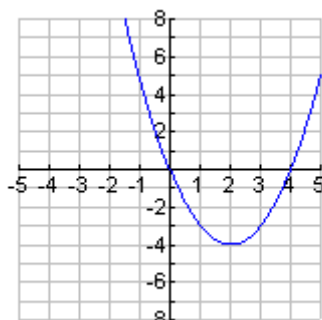
7. $y = (x-1)(x-4)$



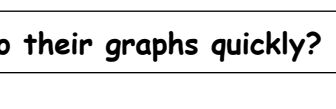
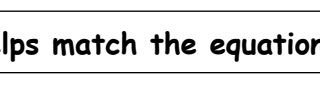
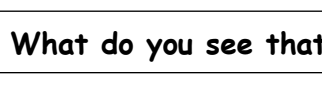
8. $y = -(x-1)(x-4)$



9. $y = (x-0)(x-4)$



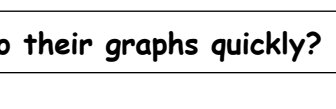
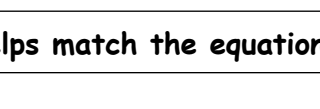
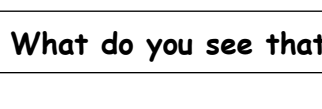
10. $y = (x+2)(x+2)$



11. $y = -(x+3)(x+3)$



12. $y = (x+4)(x+1)$

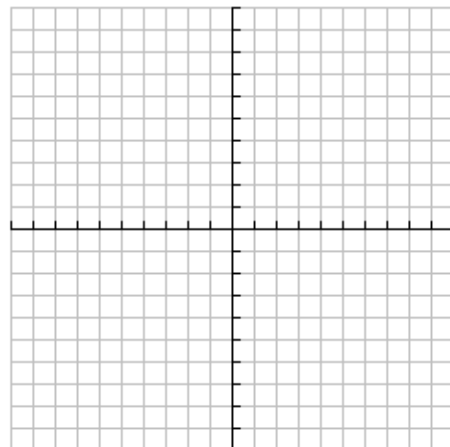


What do you see that helps match the equations to their graphs quickly?

Part B: Look carefully at absolute quadratic graphs when the equation is in factored form.

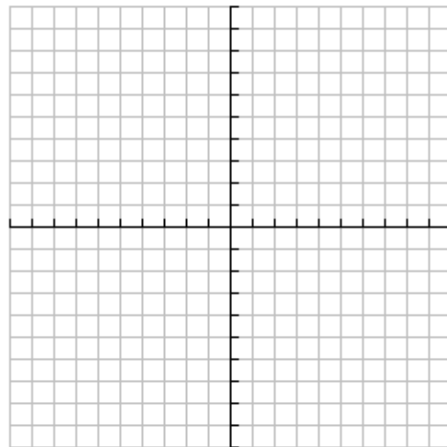
Let's try to make a high-quality graph of the $y = (x - 2)(x + 4)$ by hand. Follow these steps.

1. What are the two x-intercepts? Plot them on the grid.
2. Since quadratic graphs are symmetrical, find the line of symmetry by using the x-intercepts. Draw it in on the grid.
3. The vertex lies on the line of symmetry. What is the x value for your line of symmetry? $x = \underline{\hspace{2cm}}$
4. Use the value of the line of symmetry and the equation $y = (x - 2)(x + 4)$ to find the value of y. Plot this point (the vertex) on the grid.



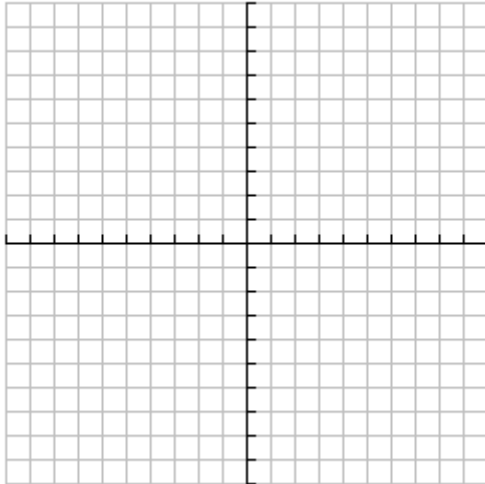
5. The y-intercept occurs when $x = 0$. Use the equation $y = (x - 2)(x + 4)$ to find the value of y when $x = 0$. Plot this point on the grid.
6. Using the line of symmetry as a mirror, find another point that should be part of the graph of $y = (x - 2)(x + 4)$. (Hint: the y-intercept can be reflected.)
7. Pick another value (like $x = 3$) that has not been used. Use the equation $y = (x - 2)(x + 4)$ to find the value of y when $x = 3$ (or whatever you chose). Plot this point on the grid.
8. Did you plot the symmetric point to the one you just found? If not, do so now.
9. With your seven points plotted, try to sketch a smooth curve for the graph of $y = (x - 2)(x + 4)$.

Use the same strategy as above to try to make a high-quality graph of the $y = (x - 5)(x + 1)$ by hand. Be sure to label points on your graph.

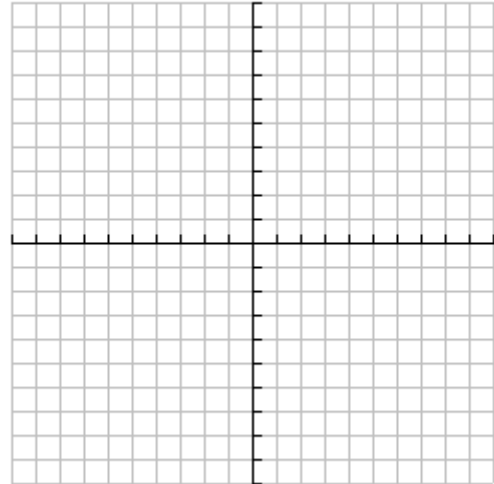


Make high quality graphs of the following by hand. Underneath each graph write down the coordinates of the zeros, the vertex, and the y-intercept .

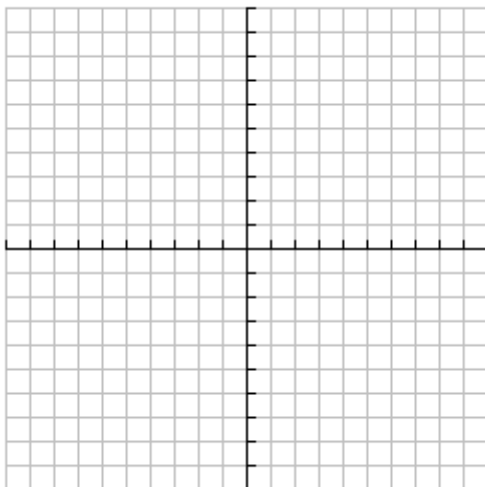
$$y = (x - 1)(x - 7)$$



$$y = -(x + 1)(x - 3)$$



$$y = -5(x - 4)(x - 2)$$



You'll need a different scale for the x and y-axis for this one. They don't need the same scale!!