



Explain: Writing Quadratic Equations

1. You have been chosen to work on a new project for Frisco ISD to install their own cell phone service for students and staff. You have plotted out the region that needs to be covered by service and determined that the region is quadratic and has roots at -3 and 5 on your graph with an a value of -2.

a) What would the factors of your equation need to be in order to have roots at -3 and 5?

b) _____ and _____
What then is the equation, in factored form?

c) Multiply out your equation and give the equation in standard form.

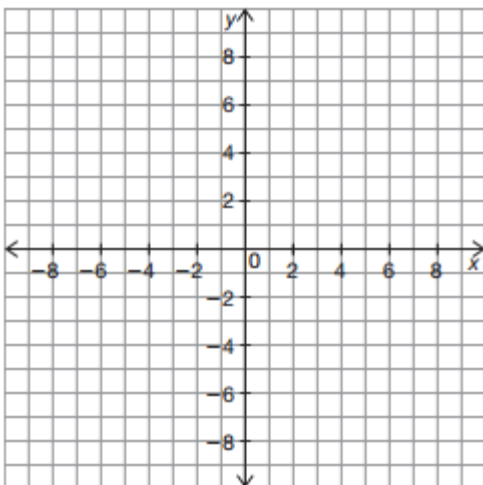
2. Now, you need a quadratic that has roots of $\frac{1}{2}$ and $-\frac{2}{3}$

a) What would the factors of this new equation be?
_____ and _____

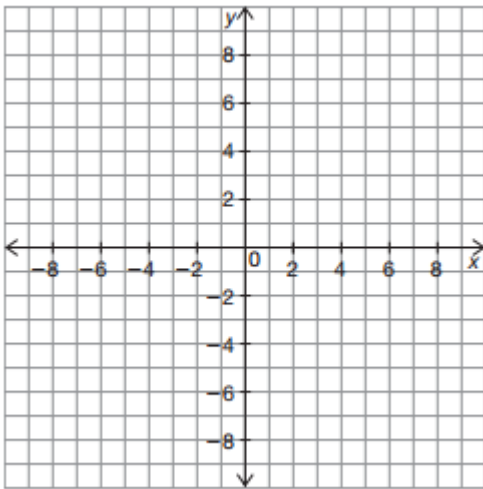
b) When writing an equation you can't have fractions in the factors. To fix that problem you multiply each factor by the common denominator of that factor. (Example: $\left(x - \frac{2}{5}\right)$ would be multiplied by 5 to yield $(5x - 2)$. Notice that if you set $5x - 2$ equal to 0 and solve you get $\frac{2}{5}$)

What is the equation of your quadratic in both factored and standard forms?

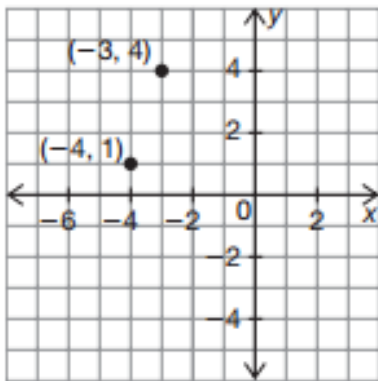
3. Given, the vertex is (3, -2) and one of the two x-intercepts is (4,0). Sketch and determine the equation of the parabola in vertex form. **You must find the "a" value!**



4. Given, the roots of the quadratic are $(2,0)$ and $(-2,0)$ and $(-1,-6)$ is another point on the parabola. Sketch and determine the equation of the parabola in standard form.



5. Given Vertex is $(-3, 4)$ and point $(-4, 1)$ Write an equation of the parabola.



6. Given standard form $y = -3x^2 - 18x - 23$, determine vertex form.

(Hint: you can complete the square, or use the formula $x = \frac{-b}{2a}$ to find the x-value of the vertex.)

7. Create a system of equations and use algebra to create a quadratic equation with points $(-1,5)$, $(0,3)$, and $(3,9)$.

8. Create a system of equations and use algebra to create a quadratic equation with points $(-4,12)$, $(0,-16)$, and $(-2,-14)$.