HAT

10/3/16

Chapter 4 Board Review

Write the equation of the parabola that passes through (2, -1) and has a maximum at (-3, 4).

$y = -\frac{1}{5}(x+3)^2 + 4$

Write the equation of the parabola that has x-intercepts of (-2, 0) and (5, 0) and a y-intercept of (0, -8).

$y = 4/5(x+2)(x-6)$

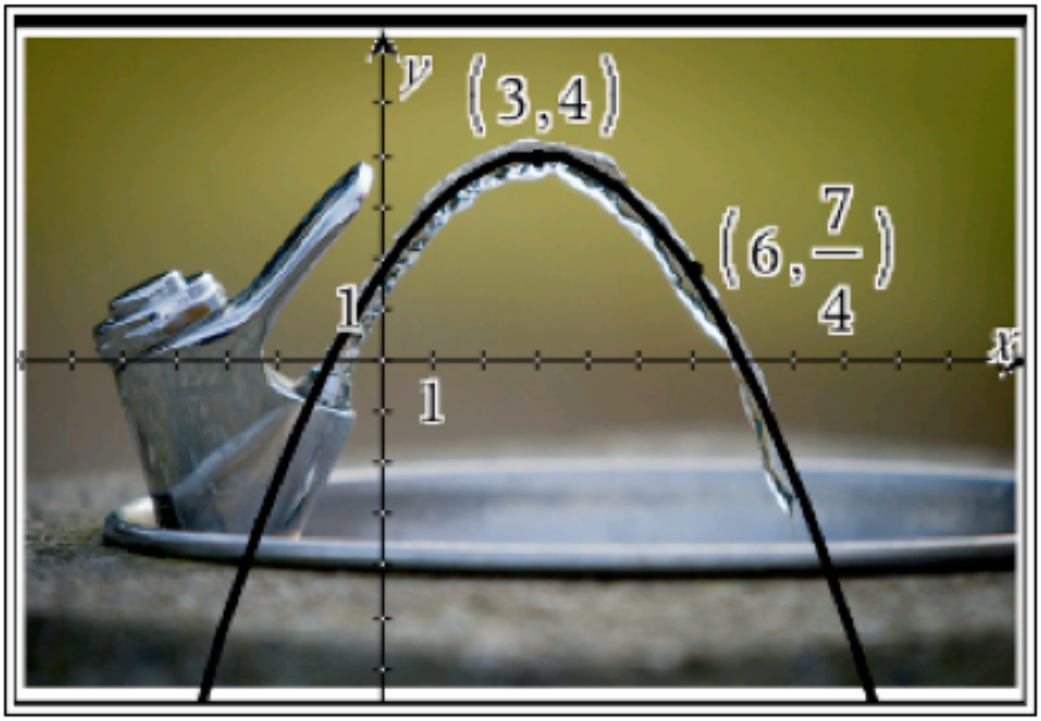
Simplify.

$$\frac{(4+2i)^2}{3-i}-(8i-3)$$

$5-2i$

$f(x)=6x^2+10x-4$

Mrs. Long fit a parabola to the stream of water from this drinking fountain.



Write the equation of the parabola in all three forms.

Vertex: $y=-\frac{1}{4}(x-3)^2+4$

Standard: $y=-\frac{1}{4}(x^2-6x+9)+4$

$y=-\frac{1}{4}x^2+\frac{3}{2}x-\frac{9}{4}+4$ $\frac{16}{4}$

$y=-\frac{1}{4}x^2+\frac{3}{2}x+\frac{7}{4}$

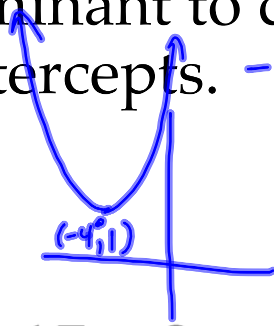
$y=-\frac{1}{4}(x^2-6x-7)$

$y=-\frac{1}{4}(x-7)(x+1)$

Given $f(x) = x^2 + 8x + 17$

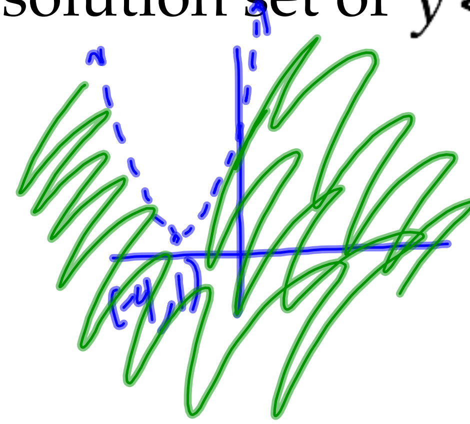
a. Find the discriminant to determine the number of x-intercepts. -4 2 complex solutions

b. Graph $f(x)$



c. Solve $x^2 + 8x + 17 = 0$ $x = -4 \pm i$

d. Show the solution set of $y < x^2 + 8x + 17$



i

Graph. Label key features.

$$f\left(x\right)=3x^2+12x-8$$

$$y=\frac{1}{2}\left(x+2\right)^2-8$$

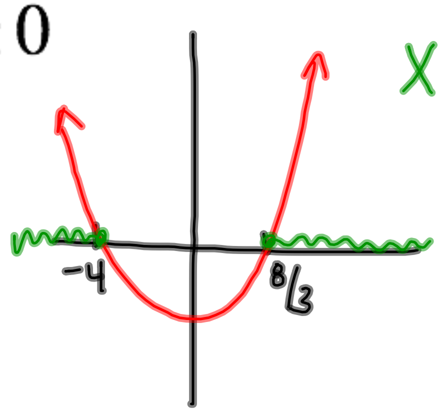
Factor and solve the inequality.

a. $3x^2 + 4x - 32 \geq 0$

$(3x-8)(x+4)$

x-int: $(8/3, 0)$

$(-4, 0)$



$x \in (-\infty, -4] \cup [8/3, \infty)$

b. $9x^2 - 15x \leq 6$

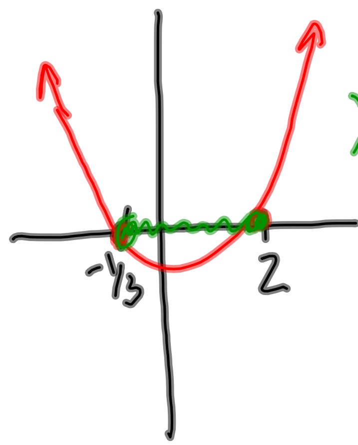
$9x^2 - 15x - 6 \leq 0$

$3(3x^2 - 5x - 2) \leq 0$

$3(3x+1)(x-2)$

x-int: $(-1/3, 0)$

$(2, 0)$



$x \in [-1/3, 2]$

$$f(x) = 6x^2 + 10x - 4$$

Factor to find the x intercepts.

$f(x) = 2(3x^2 + 5x - 2)$

$f(x) = 2(3x-1)(x+2)$

x-int: $(1/3, 0)$ & $(2,0)$

Complete the square to write in vertex form.

$f(x) = 6(x^2 + \frac{5}{3}x + \frac{25}{36}) - 4 - \frac{25}{6}$

$(x+\frac{5}{6})(x+\frac{5}{6})$

$f(x) = 6(x+\frac{5}{6})^2 - 49/6$

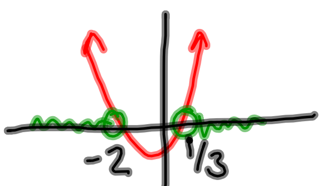
Solve

$$6x^2 + 10x - 4 = 0$$

$\boxed{\begin{matrix} x = 1/3 \\ x = -2 \end{matrix}}$

$$6x^2 + 10x - 4 > 0$$

$$y < 6x^2 + 10x - 4$$



$x \in (-\infty, -2) \cup (1/3, \infty)$