Math 121-002 : Spring 2010 : Quiz I

Problem 1 Find line through $(2,3)$ and $(4,-3)$

$y = mx + b \longrightarrow 3 = 2m + b$

$\longrightarrow -3 = 4m + b \longrightarrow b = -3 - 4m$

$\longrightarrow 3 = 2m - 3 - 4m$

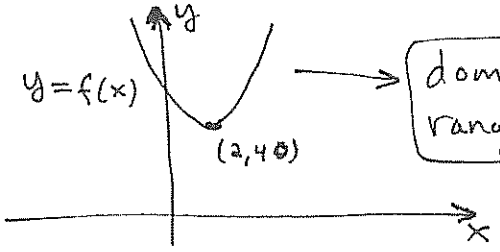
$\longrightarrow 6 = 6m$

$\longrightarrow \boxed{1 = m}$. & $\underline{b = -3 - 4 = -7}$.

$\therefore \boxed{y = x - 7}$

Problem 2 Given $f(x) = 3(x-2)^2 + 40$
find vertex of parabola $y = f(x)$
and find dom(f) and range(f)

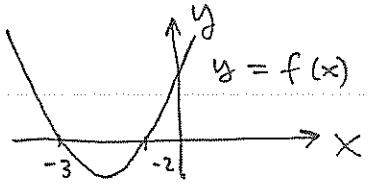
Vertex of $f(x) = A(x-h)^2 + k = y$ is (h,k).
By comparing the general form to the given one
we see $A = 3$, $h = 2$, $k = 40$ $\Rightarrow$ $\boxed{(2,40) = \text{vertex}}$



$\boxed{\begin{aligned} \text{dom}(f) &= \mathbb{R} = (-\infty, \infty) \\ \text{range}(f) &= [40, \infty) \end{aligned}}$

Problem 3 Let $f(x) = x^2 + 5x + 6$. Find zeroes of $f(x)$ and graph $y = f(x)$

$f(x) = x^2 + 5x + 6 = (x+2)(x+3)$



Problem 4 Find A, B such that $x^A y^B = \dfrac{x^{-1}(1/y^2)}{\sqrt{x}\sqrt{y}}$

$\dfrac{x^{-1}(1/y^2)}{\sqrt{x}\sqrt{y}} = x^{-1} x^{-\frac{1}{2}} y^{-2} y^{-\frac{1}{2}}$

$= x^{-3/2} y^{-5/2} \longrightarrow \boxed{A = -3/2, \quad B = -5/2}$