1 a $x = \frac{-b}{2a}$

$f(0) = 5$

36) $x^2 - 5x + 2$ $\qquad f(x) = a(x-h)^2 + K$

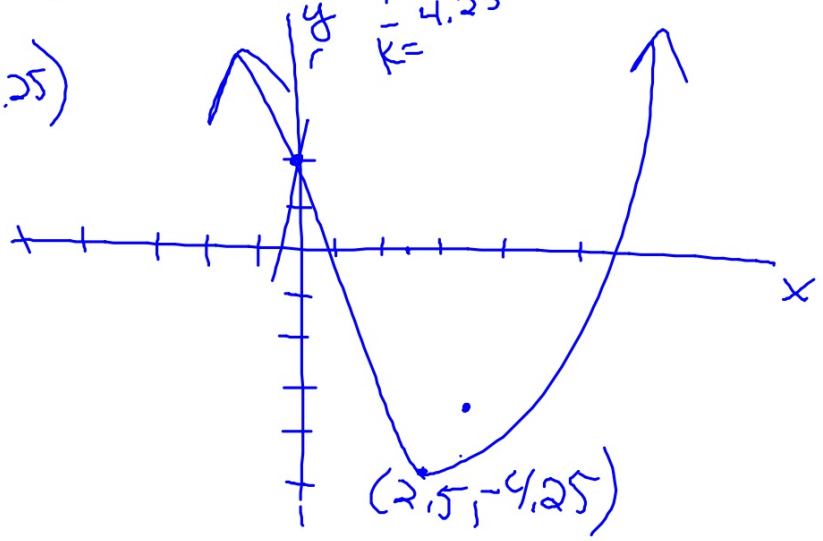
$x^2 - 5x + \frac{25}{4} + 2 - \frac{25}{4}$ $\qquad \frac{25}{4} + \frac{8}{4} = \frac{33}{4}$

$\left(\frac{-5}{2}\right)^2 = \frac{25}{4}$

$(x - \frac{5}{2})^2 + \frac{8}{4} - \frac{25}{4}$

$f(x) = (x - \frac{5}{2})^2 - \frac{17}{4}$

$(h, K) = (2.5, -4.25)$



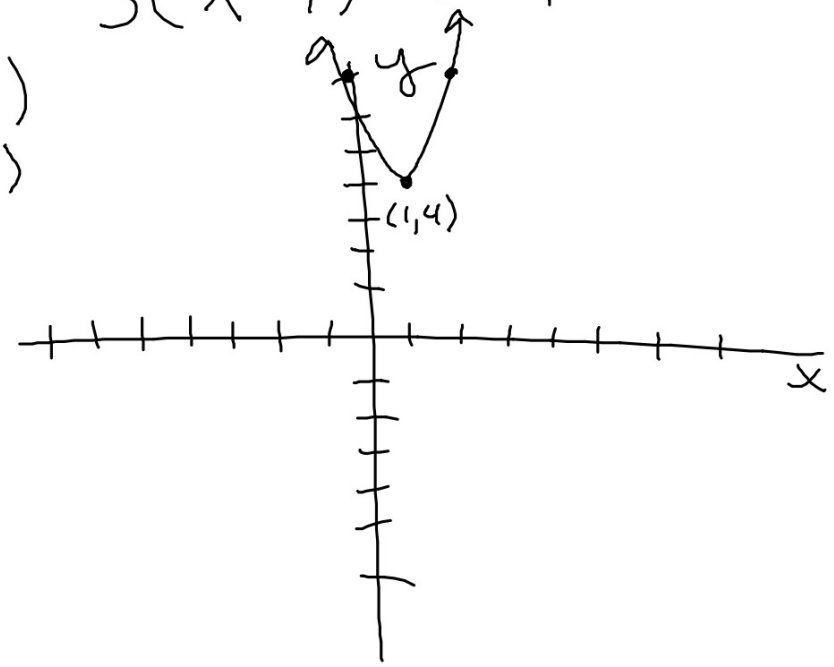
3c) $f(x) = 3x^2 - 6x + 7$

$= 3(x^2 - 2x + \underline{1}) + 7 - \underline{3}$

$= 3(x-1)^2 + 4$

vertex: $(1, 4)$

y-int: $(0, 7)$



2.4 (continued)

EQ What is the "factorized" form?

① $y = ax^2 + bx + c$ is the Standard Form

y-int is $(0, c)$

$b^2 - 4ac$ → discriminant tells us about roots

$x = \frac{-b}{2a}$ gives the equation of the line of symmetry

② $y = a(x-h)^2 + k$

vertex form

(h, k) is the vertex and a is vertical stretch/compress

③ $y = a(x-p)(x-q)$ is the Factorized form

For quadratic functions in the form $y = a(x-p)(x-q)$, the graph crosses the x-axis at $(p,0)$ and $(q,0)$ and the equation for the axis of symmetry is $x = \frac{p+q}{2}$

Ex Write the function $f(x) = x^2 + 3x - 10$ in the form $f(x) = a(x-p)(x-q)$ then sketch, labeling x and y intercepts

$a = 1$, so factor $x^2 + 3x - 10$

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

y-int: -10

axis of symm: $x = \frac{-3}{2} = -1.5$

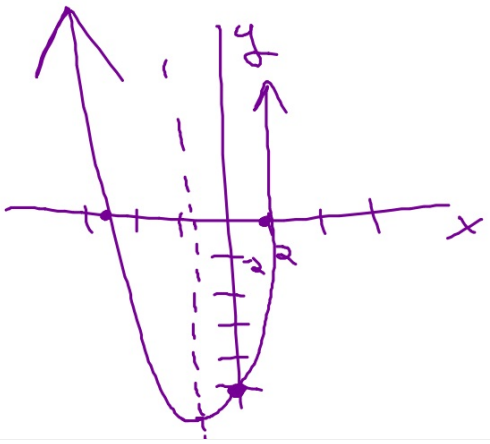
$p = 2$

$q = -5$

$x = \frac{-5+2}{2}$

$= \frac{-3}{2}$

$= -1.5$



Ex write $y = 2x^2 - x - 3$ in factorized form.

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

need to factor out 2

$= 2(x - \frac{3}{2})(x+1)$

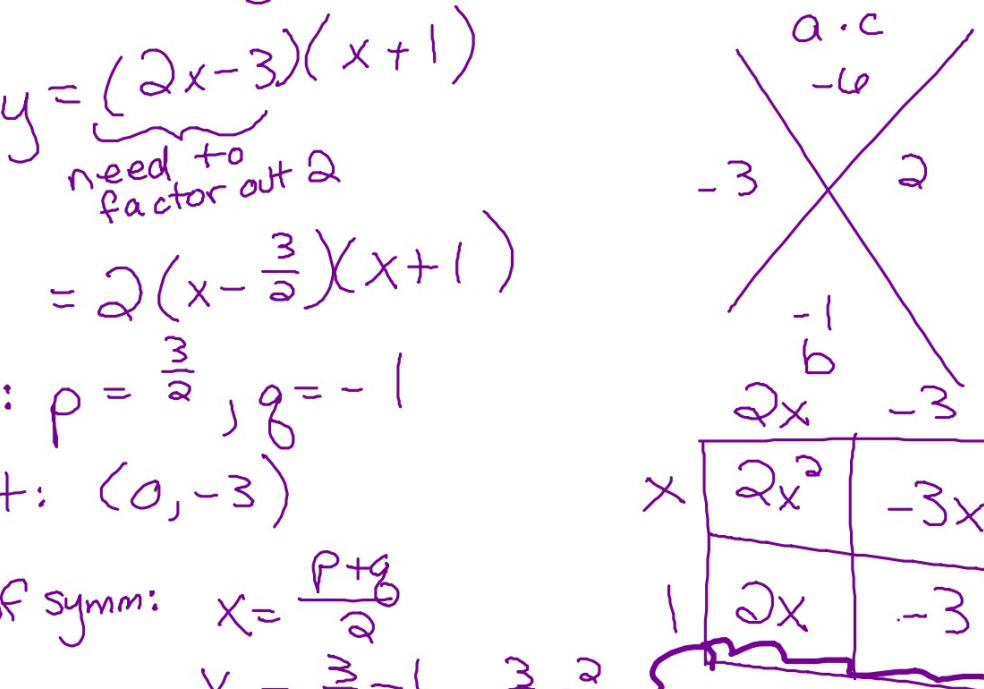
x-int: $p = \frac{3}{2}$, $q = -1$

y-int: $(0, -3)$

axis of symm: $x = \frac{p+q}{2}$

$x = \frac{\frac{3}{2} - 1}{2} = \frac{\frac{3}{2} - \frac{2}{2}}{2}$

$= \frac{\frac{1}{2}}{2} = \frac{1}{4}$



Hw 2I p. 48
#1bc, 2d, 3ad, 4, 5