6A HW: 3b, 4b, 5ef, 6bdf

3b.) $y = -3x^2 + 2x + 4$

| x | -4 | -2 | 0 | 2 | 4 |
|---|---|---|---|---|---|
| y | -52 | -12 | 4 | -4 | -36 |

$-3(-4)^2 + 2(-4) + 4 \Rightarrow -3(16) - 8 + 4 \Rightarrow$

$\Rightarrow -48 - 4 \Rightarrow -52$

$-3(-2)^2 + 2(-2) + 4 \Rightarrow -3(4) - 4 + 4 \Rightarrow -12$

$-3(2)^2 + 2(2) + 4 \Rightarrow -3(4) + 4 + 4 \Rightarrow$

$\Rightarrow -12 + 8 = -4$

$-3(4)^2 + 2(4) + 4 \Rightarrow -3(16) + 8 + 4 \Rightarrow$

$\Rightarrow -48 + 12 \Rightarrow -36$

4b.) If $f(x) = 2x^2 - x + 1$, find $f(0)$ and $f(-3)$.

$f(0)$ is always c $\therefore$ $\boxed{f(0) = 1}$

$f(-3) = 2(-3)^2 - (-3) + 1 \Rightarrow 2(9) + 3 + 1 \Rightarrow 18 + 4 \Rightarrow 22$; $\boxed{f(-3) = 22}$

5e.) $y = 3x^2 - 4x + 10$, $(2, 10)$

$\therefore 10 = 3(2)^2 - 4(2) + 10$

$10 = 3(4) - 8 + 10$

$10 = 12 + 2$

$10 \neq 14$ $\therefore$ $\boxed{\text{NO}}$

5f.) $f(x) = \frac{-1}{2}x^2 + 4x - 1$, $(2, 5)$

$\therefore 5 = \frac{-1}{2}(2)^2 + 4(2) - 1$

$5 = \frac{-1}{2}(4) + 8 - 1$

$5 = -2 + 7$

$5 = 5$ ✓ $\therefore$ $\boxed{\text{yes}}$

6b.) $y = x^2 - 4x + 7$ when $y = 3$

$\therefore 3 = x^2 - 4x + 7$

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

$0 = (x-2)^2$

$0 = x - 2$ $\therefore$ $\boxed{x = 2}$

6d.) $y = 2x^2 + 5x + 1$ when $y = 4$

$\therefore 4 = 2x^2 + 5x + 1$

$0 = 2x^2 + 5x - 3$

$0 = (2x^2 + 6x)(-x - 3)$

$2x(x+3) - 1(x+3) = 0$

$(2x - 1)(x + 3) = 0$

$\therefore$ $\boxed{x = \frac{1}{2}, \; x = -3}$

6f.) $y = \frac{-1}{2}x^2 + 2x - 1$ when $y = 2$

$\therefore 2 = \frac{-1}{2}x^2 + 2x - 1$

$0 = \frac{-1}{2}x^2 + 2x - 3$ multiply by -2 to get rid of denominator

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

not factorable, therefore there are

$\boxed{\text{no real solutions}}$