

9.5 1)

$$\alpha) \quad g(x) = f(x+2) - 1 \stackrel{f(x+2)=3(x+2)^2-2}{=} 3(x+2)^2 - 2 - 1 = 3(x^2 + 4x + 4) - 3 = 3x^2 + 12x + 9$$

$$\beta) \quad g(x) = f(x-3) + 2 \stackrel{f(x-3)=3(x-3)^2-2}{=} 3(x-3)^2 - \cancel{2} + \cancel{2} = 3(x^2 - 6x + 9) = 3x^2 + 18x + 27$$

9.5 2)

$$\alpha) \quad g(x) = f(x+3) + 1 = 2(x+3)^2 + 3 - 1 = 2(x^2 + 6x + 9) + 4 = 2x^2 + 12x + 18 + 4 = 2x^2 + 12x + 22$$

$$\beta) \quad g(x) = f(x-4) - 5 = 2(x-4)^2 + 3 - 5 = 2(x^2 - 8x + 16) - 2 = 2x^2 - 16x + 32 - 2 = 2x^2 - 16x + 30$$

9.5 3)

$$\alpha) \quad g(x) = f(x-1) + 3 = -4(x-1)^2 - 1 + 3 = -4(x^2 - 2x + 1) + 2 = -4x^2 + 8x - 4 + 2 = -4x^2 + 8x - 2$$

$$\beta) \quad g(x) = f(x+2) - 6 = -4(x+2)^2 - 1 - 6 = -4(x^2 + 4x + 4) - 7 = -4x^2 - 16x - 16 - 7 = -4x^2 - 16x - 23$$