1 (a) $\int_0^6 f(x)\,dx = (1) - (2) = \boxed{-1}$

(b) $F \downarrow$ when $F' = f < 0$: $\boxed{(2, 5)}$

(c)

x	0	1	2	3	4	5	6
$F(x)$	2	$5/2$	3	$5/2$	$3/2$	1	1

2. (a) $\int_1^2 \left(-2f(x) + 5g(x)\right) dx = -2\int_1^2 f(x)\,dx + 5\int_1^2 g(x)\,dx$

$= -2(9) + 5(3) = -18 + 15 = \boxed{-3}$

(b) $\int_2^1 f(x)\,dx = \int_1^2 f(x)\,dx = \boxed{-9}$

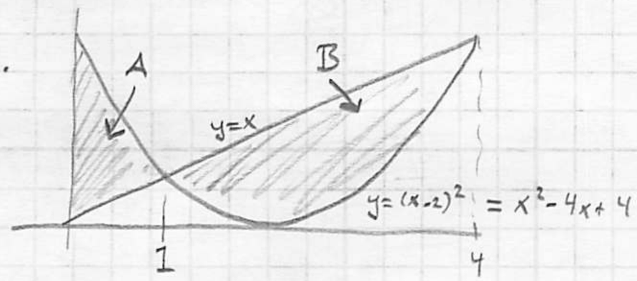
(c) $\int_2^5 f(x)\,dx = \int_1^5 f(x)\,dx - \int_1^2 f(x)\,dx = (-2) - (9) = -11$

3. $\int_0^9 \left(x^{1/2} + \frac{2Q}{3}\right) dx = \frac{2}{3}x^{3/2} + \frac{2}{3}Qx \Big|_0^9 = \frac{2}{3}\left(9^{3/2} + 9Q\right)$

$= \frac{2}{3}(27 + 9Q) = 18 + 3Q = 5$

$\Longrightarrow \boxed{Q = -\frac{13}{3}}$

4.



$A = \int_0^1 \left[(x^2-4x+4) - (x)\right] dx = \int_0^1 \left(x^2 - 5x + 4\right) dx$

$= \frac{x^3}{3} - \frac{5x^2}{2} + 4x \Big|_0^1 = \frac{1}{3} - \frac{5}{2} + 4 = \frac{2-15+24}{6} = \frac{11}{6}$

$B = \int_1^4 \left[(x) - (x^2-4x+4)\right] dx = \int_1^4 \left(-x^2 + 5x - 4\right) dx$

$= -\frac{x^3}{3} + \frac{5x^2}{2} - 4x \Big|_1^4 = \left(-\frac{64}{3} + 40 - 16\right) - \left(-\frac{1}{3} + \frac{5}{2} - 4\right)$

$= -\frac{63}{3} + 28 - \frac{5}{2} = -21 + 28 - \frac{5}{2} = 7 - 5/2 = \frac{9}{2}$

Area $= \frac{11}{6} + \frac{9}{2} = \frac{11 + 27}{6} = \boxed{\frac{38}{6}}$