c)

$$f(x) - g(x) = x^3 - 5x^2 + 6x - (x^3 - 7x^2 + 12x)$$

$$= x^3 - 5x^2 + 6x - x^3 + 7x^2 - 12x = 2x^2 - 6x$$

$$f(x) - g(x) = 0 \iff 2x(x-3) = 0 \iff \begin{array}{l} x = 0 \\ x = 3 \end{array}$$

$$\Rightarrow A = \left| \int_0^3 (f(x) - g(x)) \, dx \right|$$

$$= \left| \int_0^3 (2x^2 - 6x) \, dx \right| = \left| \left( \frac{2}{3} x^3 - 3x^2 \right) \Big|_0^3 \right|$$

$$= \left| \frac{2}{3} \cdot 27 - 3 \cdot 9 - (0 - 0) \right| = |18 - 27|$$

$$= |-9| = 9$$

d)

$$f(x) - g(x) = x \cdot (6 - 2x^2) - x \cdot (2 - x^2)$$

$$= x \cdot (6 - 2x^2 - (2 - x^2)) = x \cdot (6 - 2x^2 - 2 + x^2)$$

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

$$f(x) - g(x) = 0 \iff x = 0 / x = 2 / x = -2$$

$$\Rightarrow A = \left| \int_{-2}^{0} (f(x) - g(x)) \, dx \right| + \left| \int_{0}^{2} (f(x) - g(x)) \, dx \right|$$

$$\int (f(x) - g(x)) \, dx = \int x(4 - x^2) \, dx = \int (4x - x^3) \, dx$$

$$= 2x^2 - \frac{1}{4}x^4 + C$$

$$\left( 2x^2 - \frac{1}{4}x^4 \right) \Big|_{-2}^{0} = (0 - 0) - \left( 2 \cdot (-2)^2 - \frac{1}{4}(-2)^4 \right)$$

$$= -\left( 8 - \frac{1}{4} \cdot 16 \right) = -(8 - 4) = -4$$

$$\left(2x^2 - \frac{1}{4}x^4\right)\Big|_0^2 = \left(2\cdot 2^2 - \frac{1}{4}2^4\right) - (0-0)$$

$$= \left(2\cdot 4 - \frac{1}{4}16\right) = 8 - 4 = 4$$

$$\Rightarrow A = |-4| + |4|$$

$$= 4 + 4 = 8$$