

تمارين تطبيقيه

تمرين ① :

أنشر ثم بسط إذا كان ممكنا :

$$a = 2\sqrt{3}(-3\sqrt{2} + \sqrt{3}) \quad ; ; \quad b = -\sqrt{6}\left(\frac{1}{\sqrt{2}} - 2\sqrt{3}\right) \quad ; ; \quad c = (3\sqrt{2} + 4)(-2\sqrt{5} - 1)$$

*/ الحل :

$$a = 2\sqrt{3}(-3\sqrt{2} + \sqrt{3}) = -6\sqrt{3} \times \sqrt{2} + 2\sqrt{3}^2 = -6\sqrt{6} + 6$$

$$b = -\sqrt{6}\left(\frac{1}{\sqrt{2}} - 2\sqrt{3}\right) = -\frac{\sqrt{6}}{\sqrt{2}} + 2\sqrt{6} \times \sqrt{3} = -\sqrt{\frac{6}{2}} + 2\sqrt{18} = -\sqrt{3} + 2\sqrt{3^2 \times 2}$$

$$= -\sqrt{3} + 2 \times 3\sqrt{2} = -\sqrt{3} + 6\sqrt{2}$$

$$c = (3\sqrt{2} + 4)(-2\sqrt{5} - 1) = -6\sqrt{10} - 3\sqrt{2} - 8\sqrt{5} - 4$$

تمرين ② :

أنشر ثم بسط ما يلي إذا أمكن :

$$A = 2x(-\sqrt{2}x + 1) - x\sqrt{3}(-2x + \sqrt{3}) \quad ; ; \quad B = 3x(1 - x) + (x - \sqrt{3})(2\sqrt{2} + x)$$

$$C = \sqrt{5}x(2x - 1)(\sqrt{5} + \sqrt{3}x)$$

*/ الحل :

$$A = 2x(-\sqrt{2}x + 1) - x\sqrt{3}(-2x + \sqrt{3}) \quad ; ; \quad B = 3x(1 - x) + (x - \sqrt{3})(2\sqrt{2} + x)$$

$$= -2\sqrt{2}x^2 + 2x + 2\sqrt{3}x^2 - x\sqrt{3}^2$$

$$= 3x - 3x^2 + 2x\sqrt{2} + x^2 - 2\sqrt{6} - x\sqrt{3}$$

$$= -2\sqrt{2}x^2 + 2\sqrt{3}x^2 + 2x - 3x$$

$$= -3x^2 + x^2 + 3x + 2x\sqrt{2} - x\sqrt{3} - 2\sqrt{6}$$

$$= (-2\sqrt{2} + 2\sqrt{3})x^2 - x$$

$$= -2x^2 + (3 + 2\sqrt{2} - \sqrt{3})x - 2\sqrt{6}$$

$$C = \sqrt{5}x(2x - 1)(\sqrt{5} + \sqrt{3}x)$$

$$= (2\sqrt{5}x^2 - \sqrt{5}x)(\sqrt{5} + \sqrt{3}x)$$

$$= 2\sqrt{5}^2 x^2 + 2\sqrt{15} x^3 - \sqrt{5}^2 x - \sqrt{15} x^2$$

$$= 10x^2 + 2\sqrt{15}x^3 - 5x - \sqrt{15}x^2$$

$$= 2\sqrt{15}x^3 + (10 - \sqrt{15})x^2 - 5x$$

تمرين ③ :

عمل ما يلي :

$$A=3\sqrt{2}-15\sqrt{6}+6\sqrt{10} \quad ; ; \quad B=\sqrt{75}+2\sqrt{9}$$

*/الحل :

$$A=3\sqrt{2}-15\sqrt{6}+6\sqrt{10}=3\sqrt{2}-3\sqrt{2}\times 5\sqrt{3}+3\sqrt{2}\times 2\sqrt{5}=3\sqrt{2}(1-5\sqrt{3}+2\sqrt{5})$$

$$B=\sqrt{75}+2\sqrt{9}=\sqrt{5^2\times 3}+2\sqrt{3^2}=5\sqrt{3}+2\sqrt{3^3}=\sqrt{3}(5+2\sqrt{3})$$

تمرين ④ :

عمل ما يلي :

$$A=15a^2bc^3-5abc+25ab^2c \quad ; ; \quad B=2x(3x+1)-(3x+1)(x+3)+(3x+1)$$

$$C=(3x-2)^2-3x(3x-2)+(2-3x)$$

*/الحل :

$$A=15a^2bc^3-5abc+25ab^2c=5abc(3ac^2-1+5b)$$

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

$$=(3x+1)[2x-(x+3)+1]$$

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

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

$$C=(3x-2)^2-5x(3x-2)+(2-3x)$$

$$=(3x-2)(3x-2)-5x(3x-2)-(3x-2)$$

$$=(3x-2)[(3x-2)-5x-1]$$

$$=(3x-2)(3x-2-5x-1)$$

$$=(3x-2)(-2x-3)$$

تمرين ⑤ :

(1) - أنشر ثم بسط ما يلي إذا كان ممكنا :

$$a=(2\sqrt{2}+3)^2 \quad ; ; \quad b=(\sqrt{3}-2\sqrt{5})^2 \quad ; ; \quad c=(2\sqrt{3}-7)(2\sqrt{3}+7)$$

$$d=(2\sqrt{3}x-1)^2 \quad ; ; \quad e=(3x+\sqrt{2})^2 \quad ; ; \quad f=(3x\sqrt{5}+1)(3x\sqrt{5}-1)$$

(2) - عمل ما يلي :

$$g=\sqrt{9}-\sqrt{2^2} \quad ; ; \quad h=4\sqrt{121}-7 \quad ; ; \quad i=5-\sqrt{4}$$

$$j=25x^2+30x+9 \quad ; ; \quad k=16x^2-11 \quad ; ; \quad l=4x^2-4x\sqrt{3}+3$$

(1) - لننشر و نبسط ما يلي :

$$a = (2\sqrt{2} + 3)^2 = (2\sqrt{2})^2 + 2 \times 2\sqrt{2} \times 3 + 3^2 = 8 + 12\sqrt{2} + 9 = 17 + 12\sqrt{2}$$

$$b = (\sqrt{3} - 2\sqrt{5})^2 = \sqrt{3}^2 - 2 \times \sqrt{3} \times 2\sqrt{5} + (2\sqrt{5})^2 = 3 - 4\sqrt{15} + 20 = 23 - 4\sqrt{15}$$

$$c = (2\sqrt{3} - 7)(2\sqrt{3} + 7) = (2\sqrt{3})^2 - 7^2 = 12 - 49 = -37$$

$$c = (2\sqrt{3}x - 1)^2 = (2\sqrt{3}x)^2 - 2 \times 2\sqrt{3}x \times 1 + 1^2 = 12x^2 - 4\sqrt{3}x + 1$$

$$d = (3x + \sqrt{2})^2 = (3x)^2 + 2 \times 3x \times \sqrt{2} + \sqrt{2}^2 = 9x^2 + 6\sqrt{2}x + 2$$

$$e = (3x\sqrt{5} + 1)(3x\sqrt{5} - 1) = (3x\sqrt{5})^2 - 1^2 = 45x^2 - 1$$

(2) - لنعمل ما يلي :

$$g = \sqrt{9} - \sqrt{2}^2 = \sqrt{3}^2 - \sqrt{2}^2 = (\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2})$$

$$h = 4\sqrt{121} - 7 = (2\sqrt{11})^2 - \sqrt{7}^2 = (2\sqrt{11} - \sqrt{7})(2\sqrt{11} + \sqrt{7})$$

$$i = 5 - \sqrt{4} = \sqrt{5}^2 - \sqrt{2}^2 = (\sqrt{5} + \sqrt{2})(\sqrt{5} - \sqrt{2})$$

$$j = 25x^2 + 30x + 9 = (5x)^2 + 2 \times 5x \times 3 + 3^2 = (5x + 3)^2$$

$$k = 16x^2 - 11 = (4x)^2 - \sqrt{11}^2 = (4x - \sqrt{11})(4x + \sqrt{11})$$

$$l = 4x^2 - 4x\sqrt{3} + 3 = (2x)^2 - 2 \times 2x \times \sqrt{3} + \sqrt{3}^2 = (2x - \sqrt{3})^2$$