

سلسلة 1 للمتطابقات الهامة

تمرين 1 :

أحسب وبسط مايلي :

$$A = \frac{5}{3} - \frac{2}{3} \times \frac{1}{2} \quad ; \quad B = 3 \left(\frac{2}{5} - 1 \right) + \frac{9}{5} \quad ; \quad C = \frac{2}{5} \div \frac{4}{5} \times 2 - 3$$

تمرين 2 :

أنشر و بسط مايلي :

$$\begin{aligned} A &= 2a(-3a + 4) & ; & & B &= -3x[4 - 2x - 3(x - 1)] \\ C &= (3x - 4)(5x - 2) & ; & & D &= (-5x + 3)(2x - 4) \end{aligned}$$

تمرين 3 :

عمل مايلي :

$$\begin{aligned} A &= 6x^2 - 18x \\ B &= -2x(x - 3) + 6x(x - 3) \\ C &= (2x + 3)(x - 5) - (3x - 1)(x - 5) \\ D &= (3x - 1)^2 + (2x - 3)(3x - 1) \end{aligned}$$



تمرين 4 :

(1) أتمم الفراغ بما يناسب :

$$\begin{aligned} (\dots + b)^2 &= a^2 + \dots \dots \dots + \dots & ; & & (a - \dots)^2 &= \dots - \dots \dots \dots + b^2 \\ a^2 - b^2 &= (\dots - \dots)(\dots + \dots) & ; & & (x + \dots)^2 &= \dots + \dots \dots \dots + 36 \\ (3 - \dots)^2 &= \dots - \dots \dots \dots + y^2 & ; & & x^2 - 81 &= (\dots + \dots)(\dots - \dots) \end{aligned}$$

(2) أنشر وبسط مايلي :

$$A = (x + 3)^2 \quad ; \quad B = (2x - 5)^2 \quad ; \quad C = (x - 6)(x + 6)$$

(3) عمل مايلي :

$$A = x^2 + 6x + 9 \quad ; \quad B = 4x^2 - 20x + 25 \quad ; \quad C = x^2 - 25$$

حل السلسلة 1 للمتطابقات الهامة

تمرين 1 :

أحسب وبسط مايلي :

$$A = \frac{5}{3} - \frac{2}{3} \times \frac{1}{2} = \frac{5}{3} - \frac{2}{6} = \frac{5 \times 2}{3 \times 2} - \frac{2}{6} = \frac{10}{6} - \frac{2}{6} = \frac{8}{6}$$

$$B = 3 \left(\frac{2}{5} - 1 \right) + \frac{9}{5} = 3 \times \frac{2}{5} + 3 \times (-1) + \frac{9}{5} = \frac{6}{5} - 3 + \frac{9}{5} = \frac{6}{5} - \frac{3 \times 5}{1 \times 5} + \frac{9}{5} = \frac{6+9-15}{5} = \frac{0}{5} = 0$$

$$C = \frac{2}{5} \div \frac{4}{5} \times 2 - 3 = \frac{2}{5} \times \frac{5}{4} \times 2 - 3 = \frac{4}{4} - 3 = 1 - 3 = -2$$

تمرين 2 :

أنشر و بسط مايلي :

$$A = 2a(-3a + 4) = 2a \times (-3a) + 2a \times 4 = -6a^2 + 8a$$

$$B = -3x[4 - 2x - 3(x - 1)] = -3x[4 - 2x - 3 \times x - 3 \times (-1)]$$

$$= -3x(4 - 2x - 3x + 3) = -3x(7 - 5x) = -3x \times 7 - 3x \times (-5x) = -21x + 15x^2$$

$$C = (3x - 4)(5x - 2) = 3x \times 5x + 3x \times (-2) - 4 \times 5x - 4 \times -2$$

$$= 15x^2 - 6x - 20x + 8 = 15x^2 - 26x + 8$$

$$D = (-5x + 3)(2x - 4) = -5x \times 2x - 5x \times -4 + 3 \times 2x + 3 \times -4$$

$$= -10x^2 + 20x + 6x - 12 = -10x^2 + 26x - 12$$

تمرين 3 :

عمل مايلي :

$$A = 6x^2 - 18x = 6x \times x - 3 \times 6 \times x = 6x(x - 3)$$

$$B = -2x(x - 3) + 6x(x - 3) = (x - 3)(-2x + 6x)$$

$$= 4x(x - 3)$$

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

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

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

$$= (x - 5)(-x + 4)$$

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

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

$$= (3x - 1)(5x - 4)$$

تمرين 4 :

(1) أتمم الفراغ بما يناسب :

$$(a + b)^2 = a^2 + 2ab + b^2 \quad ; \quad (a - b)^2 = a^2 - 2ab + b^2$$

$$a^2 - b^2 = (a - b)(a + b) \quad ; \quad (x + 6)^2 = x^2 + 2 \times x \times 6 + 36$$

$$(3 - y)^2 = 9 - 2 \times 3 \times y + y^2 \quad ; \quad x^2 - 81 = (x + 9)(x - 9)$$

(2) أنشر وبسط مايلي :

$$A = (x + 3)^2 = x^2 + 2 \times x \times 3 + 3^2 = x^2 + 6x + 9$$

$$B = (2x - 5)^2 = (2x)^2 - 2 \times 2x \times 5 + 5^2 = 4x^2 - 20x + 25$$

$$C = (x - 6)(x + 6) = x^2 - 6^2 = x^2 - 36$$

عمل مايلي :

$$A = x^2 + 6x + 9 = x^2 + 2 \times x \times 3 + 3^2 = (x + 3)^2$$

$$B = 4x^2 - 20x + 25 = (2x)^2 - 2 \times 2x \times 5 + 5^2 = (2x - 5)^2$$

$$C = x^2 - 36 = (x - 6)(x + 6)$$

تعلم توحيد المقام

الحالة 1 : نفس المقام.

$$\frac{3}{6} + \frac{1}{6} = \frac{3+1}{6} = \frac{4}{6}$$

الحالة 2 : توجد علاقة مشتركة في المقام.

توجد علاقة بين 4 و 12 لأن $4 \times 3 = 12$

$$\frac{5}{4} - \frac{9}{12} = \frac{5 \times 3}{4 \times 3} - \frac{9}{12} = \frac{15}{12} - \frac{9}{12} = \frac{15-9}{12} = \frac{6}{12}$$

الحالة 3 : لا توجد علاقة مشتركة في المقام.

لا يوجد شيء نضربه في 3 يعطينا 7

$$\frac{4}{3} + \frac{2}{7} = \frac{7 \times 4}{21} + \frac{3 \times 2}{21} = \frac{28}{21} + \frac{6}{21} = \frac{34}{21}$$

سلسلة 2 للنشر والتعميل

تمرين 1 :

(1) أزل الأقواس وأحسب مايلي :

$$A = -2x - (-3y - 4) + (2x - 6) \quad ; \quad B = -(3 - 5x + y) - (-3 - y + 2)$$

$$C = -[-2(6 - x + y) + (x - 8)] - (-7 - x + y) \quad ; \quad D = 3 + [-5(y - 2) - 4]$$

(2) أحسب مايلي :

$$A = 5 - 3 \times \frac{6}{9} + 7 \div \frac{7}{3} \quad ; \quad B = \frac{3}{2} \times \frac{8}{2} + 6 - \frac{5}{3} \div \frac{5}{6} - 3$$

$$C = \frac{3}{2} - \left[\frac{2}{3} - \left(\frac{5}{12} - \frac{3}{4} \right) \right] \quad ; \quad D = \frac{2 + \frac{1}{5}}{\frac{3}{2} - \frac{2}{8}}$$

تمرين 2 :

أنشر وبسط مايلي :

$$A = \sqrt{5}(x - 2 + \sqrt{3}) \quad ; \quad B = -3x(2x - 4y + 5)$$

$$C = \frac{5}{3}x(-3x + 3) - \left(\frac{3}{2}x - 2 \right)(6x + 2) \quad ; \quad D = (3x - 1)(2x + 5) - \sqrt{3}(5x - \sqrt{2})$$

$$E = (2x - 5)^2 - 3(4x - 8) \quad ; \quad F = (3 - \sqrt{5})(3 + \sqrt{5}) - (1 + 2\sqrt{3})^2$$

تمرين 3 :

عمل مايلي :

$$A = x^2 + 2xy \quad ; \quad B = 3x^2 - 3x \quad ; \quad C = x^2 - 18x + 81$$

$$D = (x + 2)^2 - (x + 2)(3x + 1) \quad ; \quad E = 4x - 6 + (2x - 3)(x + 5)$$

$$F = (3x - 5)^2 - 36 \quad ; \quad G = 25x^2 - \frac{9}{4} \quad ; \quad H = 16x^2 - 81 - 3(4x + 9)$$

حل سلسلة 2 للنشر والتعميل

تمرين 1 :

(1) أزل الأقواس وأحسب مايلي :

$$A = -2x - (-3y - 4) + (2x - 6) = -2x + 3y + 4 + 2x - 6$$

$$= -2x + 2x + 3y + 4 - 6 = 3y - 2$$

$$B = -(3 - 5x + y) - (-3 - y + 2) = -3 + 5x - y + 3 + y - 2$$

$$= 5x + y - y - 3 + 3 - 2 = 5x - 2$$

$$C = -[-2(6 - x + y) + (x - 8)] - (-7 - x + y)$$

$$= -[-12 + 2x - 2y + x - 8] + 7 + x - y$$

$$= 12 - 2x + 2y - x + 8 + 7 + x - y = -2x + y + 27$$

$$D = 3 + [-5(y - 2) - 4] = 3 + [-5y + 10 - 4]$$

$$= 3 - 5y + 10 - 4 = -5y + 9$$

(2) أحسب مايلي :

$$A = 5 - 3 \times \frac{6}{9} + 7 \div \frac{7}{3} = 5 - \frac{3 \times 6}{9} + 7 \times \frac{3}{7} = 5 - \frac{18}{9} + 3 = 5 - 2 + 3 = 6$$

$$B = \frac{3}{2} \times \frac{8}{2} + 6 - \frac{5}{3} \div \frac{5}{6} - 3 = \frac{24}{4} + 6 - \frac{5}{3} \times \frac{6}{5} - 3$$

$$= 6 + 6 - \frac{6}{3} - 3 = 12 - 2 - 3 = 12 - 5 = 7$$

$$C = \frac{3}{2} - \left[\frac{2}{3} - \left(\frac{5}{12} - \frac{3}{4} \right) \right] = \frac{3}{2} - \left[\frac{2}{3} - \left(\frac{5}{12} - \frac{3 \times 3}{4 \times 3} \right) \right] = \frac{3}{2} - \left[\frac{2}{3} - \left(\frac{5}{12} - \frac{9}{12} \right) \right]$$

$$= \frac{3}{2} - \left[\frac{2}{3} - \left(\frac{5-9}{12} \right) \right] = \frac{3}{2} - \left[\frac{2}{3} - \left(-\frac{4}{12} \right) \right] = \frac{3}{2} - \left[\frac{2}{3} + \frac{4}{12} \right]$$

$$= \frac{3}{2} - \left[\frac{2 \times 4}{3 \times 4} + \frac{4}{12} \right] = \frac{3}{2} - \left(\frac{8}{12} + \frac{4}{12} \right) = \frac{3}{2} - \frac{12}{12} = \frac{3}{2} - 1$$

$$= \frac{3}{2} - \frac{1 \times 2}{1 \times 2} = \frac{3}{2} - \frac{2}{2} = \frac{1}{2}$$

$$D = \frac{2 + \frac{1}{5}}{\frac{3}{2} - \frac{8}{8}} = \frac{\frac{2 \times 5 + 1}{5}}{\frac{\frac{1 \times 5}{3 \times 4} + \frac{5}{2}}{2}} = \frac{\frac{10 + 1}{5}}{\frac{\frac{5}{12} + \frac{5}{2}}{2}} = \frac{\frac{11}{5}}{\frac{5}{10} - \frac{5}{10}} = \frac{11}{5} \times \frac{8}{10} = \frac{88}{50}$$

تمرين 2 :

أنشر وبسط مايلي : يمكن ضرب $\sqrt{5}$ في $\sqrt{3}$ لتعطي $\sqrt{15}$ ↓

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

$$B = -3x(2x - 4y + 5) = -6x^2 + 12xy - 15x$$

$$C = \frac{5}{3}x(-3x + 3) - \left(\frac{3}{2}x - 2\right)(6x + 2)$$

$$= \frac{5}{3}x \times (-3x) + \frac{5}{3}x \times 3 - \left(\frac{3}{2}x \times 6x + \frac{3}{2}x \times 2 - 2 \times 6x - 2 \times 2\right)$$

$$= -5x^2 + 5x - \left(\frac{18}{2}x^2 + 3x - 12x - 4\right)$$

$$= -5x^2 + 5x - 9x^2 - 3x + 12x + 4$$

$$= -5x^2 - 9x^2 + 5x - 3x + 12x + 4$$

$$= -14x^2 + 14x + 4$$

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

$$= 3x \times 2x + 3x \times 5 - 1 \times 2x - 1 \times 5 - \sqrt{3} \times 5x - \sqrt{3} \times -\sqrt{2}$$

$$= 6x^2 + 15x - 2x - 5 - 5\sqrt{3}x + \sqrt{6}$$

$$= 6x^2 + 15x - 2x - 5\sqrt{3}x - 5 + \sqrt{6}$$

$$= 6x^2 + 13x - 5\sqrt{3}x - 5 + \sqrt{6}$$

$$E = (2x - 5)^2 - 3(4x - 8) = (2x)^2 - 2 \times 2x \times 5 + 5^2 - 12x + 24$$

$$= 4x^2 - 20x + 25 - 12x + 24 = 4x^2 - 32x + 49$$

$$F = (3 - \sqrt{5})(3 + \sqrt{5}) - (1 + 2\sqrt{3})^2 = 3^2 - \sqrt{5}^2 - (1^2 + 2 \times 1 \times 2\sqrt{3} + (2\sqrt{3})^2)$$

$$= 9 - 5 - (1 + 4\sqrt{3} + 2^2 \times 3) = 4 - (1 + 4\sqrt{3} + 12) = 4 - (13 + 4\sqrt{3})$$

$$= 4 - 13 - 4\sqrt{3} = -9 + 4\sqrt{3}$$

تمرين 3 :

عمل مايلي :

$$A = x^2 + 2xy = x \times x + 2xy = x(x + 2y)$$

$$B = 3x^2 - 3x = 3x \times x - 3x \times 1 = 3x(x - 1)$$

$$C = x^2 - 18x + 81 = x^2 - 2 \times x \times 9 + 9^2 = (x - 9)^2$$

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

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

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

$$E = 4x - 6 + (2x - 3)(x + 5) = 2(2x - 3) + (2x - 3)(x + 5)$$

$$= (2x - 3)(2 + x + 5) = (2x - 3)(x + 7)$$

$$F = (3x - 5)^2 - 36 = (3x - 5)^2 - 6^2 = (3x - 5 + 6)(3x - 5 - 6)$$

$$= (3x + 1)(3x - 11)$$

$$G = 25x^2 - \frac{9}{4} = (5x)^2 - \left(\frac{3}{2}\right)^2 = \left(5x - \frac{3}{2}\right)\left(5x + \frac{3}{2}\right)$$

$$H = 16x^2 - 81 - 3(4x + 9) = (4x)^2 - 9^2 - 3(4x + 9)$$

$$= (4x - 9)(4x + 9) - 3(4x + 9) = (4x + 9)(4x - 9 - 3) = (4x + 9)(4x - 12)$$

تذكر أن : بحيث كل من **b** و **d** تخالف 0

$$\frac{a}{b} \times \frac{c}{d} = \frac{a \times c}{b \times d}$$

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c} = \frac{a \times d}{b \times c}$$

$$\frac{a}{b} + \frac{c}{d} = \frac{a \times d + c \times b}{b \times d}$$

$$\frac{a}{b} - \frac{c}{d} = \frac{a \times d - c \times b}{b \times d}$$