$\boxed{2F}$ $2kx^2 + (4k+3)x + k - 3 = 0$

$$\Delta = (4k+3)^2 - 4\overset{8k}{\cancel{(2k)}}(k-3)$$

$$= 16k^2 + 24k + 9 - 8k^2 + 24k$$

$$= 8k^2 + 48k + 9 < 0$$

$$k = \frac{-48 \pm \sqrt{48^2 - 4(8)(9)}}{2(8)}$$

$$= \frac{-\overset{12}{\cancel{48}} \pm \overset{3}{\cancel{12}}\sqrt{14}}{\cancel{16}\,4}$$

$\sqrt{2016}$

$\sqrt{4 \cdot 504}$

$\sqrt{16 \cdot 126}$

$\sqrt{16 \cdot 9 \cdot 14}$

$4 \cdot 3$

$\frac{-12 - 3\sqrt{14}}{4}$ $\qquad$ $\frac{-12 + 3\sqrt{14}}{4}$

≈ -5.8 $\qquad$ ≈ -0.19

$$\frac{-12 - 3\sqrt{14}}{4} < k < \frac{-12 + 3\sqrt{14}}{4}$$

$\boxed{3H}$ #1a

$$\lambda \cdot f(x) + \mu \cdot g(x) = 13x + 13$$

$$\lambda(2x^2 + 3x + 1) + \mu(3x^2 - 2x - 5)$$

$$= 13x + 13$$

$$2\lambda x^2 + 3\lambda x + \lambda + 3\mu x^2 - 2\mu x - 5\mu$$

$$= 13x + 13$$

$$x^2(2\lambda + 3\mu) + x(\underline{3\lambda - 2\mu})$$

$$+ (\underline{\lambda - 5\mu}) = 13x \underline{+13}$$

$$\begin{cases} 3\lambda - 2\mu = 13 \\ \lambda - 5\mu = 13 \\ 2\lambda + 3\mu = 0 \end{cases}$$

$$\begin{cases} -2\lambda + 10\mu = -26 \\ 2\lambda + 3\mu = 0 \end{cases}$$

$$\begin{cases} \lambda - 5\mu = 13 \\ 0 + 13\mu = -26 \end{cases}$$

$$\begin{cases} 3\lambda - 2\mu = 13 \\ \lambda - 5\mu = 13 \\ 2\lambda + 3\mu = 0 \end{cases}$$

$$\begin{cases} -2\lambda + 10\mu = -26 \\ 2\lambda + 3\mu = 0 \end{cases}$$

$$\begin{cases} \lambda - 5\mu = 13 \\ 0 + 13\mu = -26 \end{cases}$$

$\mu = -2$

$\lambda - 5(-2) = 13$

$\lambda = 3$

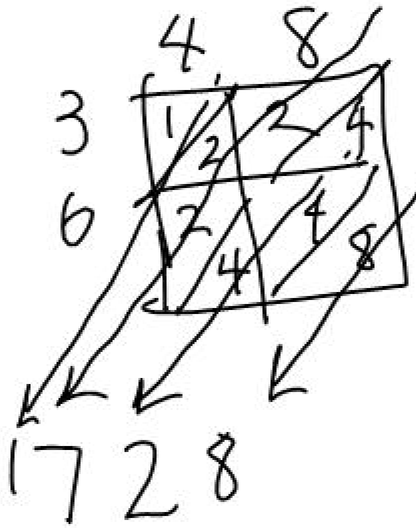
$3(3) - 2(-2) = 13$ ✓

Ex. $(x^2 - 3x + 2)(4x^2 + 2x - 3)$

$$\begin{array}{rrrrr} 4x^4 & +2x^3 & -3x^2 & & \\ & -12x^3 & -6x^2 & +9x & \\ & & 8x^2 & +4x & -6 \\ \hline 4x^4 & -10x^3 & -x^2 & +13x & -6 \end{array}$$

$\boxed{3H}$ #7

$$f(2x-1) = 16x^4 - 32x^3 + 12x^2$$



$$a(2x-1)^4 + b(2x-1)^3 + c(2x-1)^2 + d(2x-1) + e$$

$$= 16x^4 - 32x^3 + 12x^2$$

continued

Binomials raised to Powers
The Grown-up Way

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

$\binom{5}{2} \to 10 \cdot 9 \cdot 8$

$5 \cdot 81 \cdot 2 \qquad 10 \cdot 27 \cdot 4$

$$= (3x)^5 + \binom{5}{1}(3x)^4 \cdot 2 + \binom{5}{2}(3x)^3 \cdot 2^2$$

$5 \cdot 3 \cdot 16$

$$+ \binom{5}{3}(3x)^2\, 2^3 + \binom{5}{4}(3x)^1\, 2^4 + 2^5$$

$$= 243x^5 + 810x^4 + 1080x^3 + 720x^2$$
$$+ 240x + 32$$

$$\binom{n}{r} = \frac{n!}{r!\,(n-r)!}$$

$$\binom{6}{3} = \frac{6!}{3!\,(6-3)!} = \frac{\cancel{6}\cdot 5\cdot 4\cdot \cancel{3!}}{\cancel{3!}\cdot \cancel{3\cdot 2}}$$

$$= 20$$

Calculator

6 $\boxed{\text{MATH}}$ $\boxed{\text{PROB}}$ $\boxed{3}$ 3

6 nCr 3

$$\binom{n}{r} = \binom{n}{n-r} \qquad \binom{10}{4} = \binom{10}{6}$$

$$\binom{n}{1} = n \qquad \binom{n}{0} = 1$$

$$\binom{n}{n} = 1$$

$\boxed{\begin{matrix}3\# \\ \#7\end{matrix}}$

$$(2x-1)^4 = (2x)^4 + \binom{4}{1}(2x)^3(-1) + \binom{4}{2}(2x)^2(-1)^2$$
$$+ \binom{4}{3}(2x)^1(-1)^3 + (-1)^4$$

$6 : 4 . 1$

$$a(2x-1)^4 + b(2x-1)^3 + c(2x-1)^2 + d(2x-1) + e$$

$$= 16x^4 - 32x^3 + 12x^2$$

$$a(16x^4 \boxed{-32x^3} + 24x^2 - 8x + 1)$$
$$+ b(\boxed{8x^3} - 12x^2 + 6x - 1)$$
$$+ c(4x^2 - 4x + 1) + d(2x-1) + e$$

$$= x^4(16a) + x^3(-32a + 8b)$$
$$+ x^2(24a - 12b + 4c) +$$
$$+ x(-8a + 6b - 4c + 2d)$$
$$+ (a - b + c - d + e)$$

System of Equations

$$\begin{cases} 16a = 16 \\ -32a + 8b = -32 \\ 24a + 12b + 4c = 12 \\ -8a + 6b - 4c + 2d = 0 \\ a - b + c - d + e = 0 \end{cases}$$

$a = 1$

$$-32(1) + 8b = -32$$

$$8b = 0$$

$$b = 0$$

$$24(1) + 12(0) + 4c = 12$$

$$4c = -12$$

$$c = -3$$

$$-8 - 4(-3) + 2d = 0$$

$$2d = -4 \rightarrow d = -2$$

$$1 - 3 + 2 + e = 0$$

$$e = 0$$

1

HW $\boxed{\text{3H \#1b, \#2-6, 8}}$

$$\boxed{1(2x-1)^4-3(2x-1)^2-2(2x-1)}$$