

$$\begin{aligned}
 3) & -xy [3xy(x^2 - 3xy - \frac{1}{3}y^2) - (x^2 - xy)(y^2 + 3xy)] - (-xy)^3 = \\
 & = -xy [3x^3y - 9x^2y^2 - xy^3 - (x^2y^2 + 3x^3y - xy^3 - 3x^2y^2)] - (-x^3y^3) = \\
 & = -xy [3x^3y - 9x^2y^2 - xy^3 - x^2y^2 - 3x^3y + xy^3 + 3x^2y^2] - (-x^3y^3) = \\
 & = -xy [-8x^2y^2 + 2x^2y^2] + x^3y^3 = \\
 & = -6x^3y^3 + x^3y^3 = \\
 & = -5x^3y^3 \quad \checkmark
 \end{aligned}$$

APPROVED

1 2 1
1 3 3 1
1 4 6 4 1

$$\begin{aligned}
 4) & (5x+y)(5x-y) - (4x+5y)(4x-5y) - 28y^2 = \\
 & = 25x^2 - y^2 - (16x^2 - 25y^2) - 28y^2 = \\
 & = 25x^2 - y^2 - 16x^2 + 25y^2 - 28y^2 = \\
 & = (25 - 16)x^2 + (-y^2 + 25y^2 - 28y^2) = \\
 & = 9x^2 - 4y^2 \quad \checkmark
 \end{aligned}$$

$$\begin{aligned}
 5) & \left(\frac{1}{2}x + 3y\right)^2 - \left(\frac{1}{2}x - 2y\right)^2 = \\
 & = \left(\frac{1}{4}x^2 + 2\left(\frac{1}{2}x\right)(3y) + 9y^2\right) - \left(\frac{1}{4}x^2 + 2\left(\frac{1}{2}x\right)(-2y) + 4y^2\right) = \\
 & = \frac{1}{4}x^2 + 3xy + 9y^2 - \frac{1}{4}x^2 + 2xy - 4y^2 = \\
 & = 5xy + 5y^2 \quad \checkmark
 \end{aligned}$$

$$\begin{aligned}
 6) & (x+2)^3 - (x-2)^3 - 4(3x^2 - 1) = \\
 & = (x^3 + 3(x)^2(2) + 3(x)(2)^2 + 8) - (x^3 + 3(x)^2(2) + 3(x)(2)^2 - 8) - \\
 & - 4(3x^2 - 1) = \\
 & = x^3 + 6x^2 + 12x + 8 - (x^3 + 6x^2 + 12x - 8) - 4(3x^2 - 1) = \\
 & = x^3 + 6x^2 + 12x + 8 - x^3 - 6x^2 - 12x + 8 - 12x^2 + 4 = \\
 & = 20 \quad \checkmark
 \end{aligned}$$

$$\begin{aligned}
 7) & (a-1)^4 = A^4 + 4(A)^3(b) + 6(A)^2(b)^2 + 4(A)(b)^3 + B^4 = \\
 & = (a^4 + 4(a)^3(-1) + 6(a)^2(-1)^2 + 4(a)(-1)^3 + 1) = \\
 & = a^4 - 4a^3 + 6a^2 - 4a + 1 \quad \checkmark
 \end{aligned}$$

8) $x^4 : (x^2 + x + 1)$

x^4	0	0	0	0	$x^2 + x + 1$
$-x^4$	$-x^3$	$-x^2$	0	0	$x^2 - x$
$\parallel -x^3 - x^2 \quad 0 \quad 0$					
$\parallel +x^3 + x^2 + x$					
$\parallel \parallel +x \quad 0$					

$Q = x^2 - x \quad R = x$

$V = (x^2 - x)(x^2 + x + 1) + x =$
 $= x^4 + x^2 - x^3 - x^2 + x + x =$
 $= x^4$

9) $(y^3 - 7y + 6) : (y - 1)$

y^3	0	$-7y$	$+6$	
$Q = +1$	1	$+1$	-6	
$\parallel 1 \quad 1 \quad -6 \quad 0$				

$Q = y^2 + y - 6 \quad R = 0$

$R = (1) = (1)^3 - 7(1) + 6 =$
 $= 1 - 7 + 6 =$
 $= 0$

10) $(4b^4 - 5b^2 + b + 3) : (b + 1)$

4	0	-5	$+1$	$+3$	
$Q = -1$	-4	$+4$	$+1$	-2	
$\parallel 4 \quad -4 \quad -2 \quad +2 \quad 1$					

$Q = 4b^3 - 4b^2 - b + 2$
 $R = 1$

$R = 4(-1)^4 - 5(-1)^2 + (-1) + 3 =$
 $= 4 - 5 - 1 + 3 = 1$