

$$P(x) = 3x^2 + 5x + 8$$

$$Q(x) = 5x^2 + 7x + 12$$

$$P(x) + Q(x) = 8x^2 + 12x + 20$$

$$\begin{array}{r} 3x^2 + 5x + 8 \\ 5x^2 + 7x + 12 \\ \hline \end{array}$$

$$8x^2 + 12x + 20$$

$$P(x) - Q(x)$$

$$-Q(x) = -5x^2 - 7x - 12$$

$$\begin{array}{r} 3x^2 + 7x + 8 \\ -5x^2 - 7x - 12 \\ \hline \end{array}$$

$$-2x^2 - 4$$

$$P(x) - Q(x) = -2x^2 - 4$$

$$P(x) = 4x^2 - 3x + 5$$

$$Q(x) = 6x^3 - 5x + 8$$

$$\begin{array}{r} 4x^2 - 3x + 5 \\ 6x^3 \quad - 5x + 8 \\ \hline \end{array}$$

$$6x^3 + 4x^2 - 8x + 13$$

$$P(x) + Q(x)$$

$$\begin{array}{r} 4x^2 - 3x + 5 \\ -6x^3 \quad + 5x - 8 \\ \hline \end{array}$$

$$-6x^3 + 4x^2 + 2x - 3$$

$$P(x) - Q(x)$$

$$3x^2 + 5x + 8$$

$$3x + 2$$

$$6x^2 + 10x + 16$$

$$9x^3 + 15x^2 + 24x$$

$$9x^3 + 21x^2 + 34x + 16$$

$$4x^2 + 6x + 10$$

$$5x + 8$$

$$32x^2 + 48x + 80$$

$$20x^3 + 30x^2 + 50x$$

$$20x^3 + 62x^2 + 98x + 80$$

$$\begin{array}{r} 3x^2 - 5x + 8 \\ -3x + 2 \\ \hline \end{array}$$

$$\begin{array}{r} 6x^2 - 10x + 16 \\ -9x^3 + 15x^2 - 24x \\ \hline \end{array}$$

$$-9x^3 + 21x^2 - 34x + 16$$

$$5x^4 + 2x - 5$$

$$3x^2 + 8$$

$$\begin{array}{r} 15x^6 \quad 40x^4 \quad +16x - 40 \\ +6x^3 - 15x^2 \\ \hline \end{array}$$

$$15x^6 + 40x^4 + 6x^3 - 15x^2 + 16 - 40$$

$$a) f(x) = x^3 + x^2 - 4x - 4$$

$$\cancel{1}, \cancel{2}, -2, 4, -4$$

1	1	-4	-4
-1	-1	0	4
1	0	-4	0
2	2	4	
1	-2	0	
-2	-2		
1	0		

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