

1)  $4x^2 + 13x - 12$  48

*diff*

$$\frac{4x^2}{x} - \frac{3x}{x} + \frac{16x}{4} - \frac{12}{4}$$

1	48
2	24
-3	+16
4	12
6	8

$$\frac{x(4x-3)}{4x-3} + \frac{4(4x-3)}{4x-3}$$

$$(4x-3)(x+4)$$

2)  $10x^2 - 9x + 2$  20

*sum*

$$\frac{10x^2}{2x} - \frac{4x}{2x} - \frac{5x}{1} + \frac{2}{1}$$

1	20
2	10
-4	-5

$$\frac{2x(5x-2)}{5x-2} - \frac{1(5x-2)}{5x-2}$$

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

3)  $4y^2 - 14y + 6y - 21$

$$\frac{4y^2}{2y} - \frac{14y}{2y} + \frac{6y}{3} - \frac{21}{3}$$

$$\frac{2y(2y-7)}{2y-7} + \frac{3(2y-7)}{2y-7}$$

$$(2y-7)(2y+3)$$

4)  $6x^2 - 46x + 28$  42

*sum*

$$2[3x^2 - 23x + 14]$$

1	42
-2	-21
3	14
6	7

$$\frac{3x^2}{x} - \frac{2x}{x} - \frac{21x}{-7} + \frac{14}{-7}$$

$$\frac{x(3x-2)}{3x-2} - \frac{7(3x-2)}{3x-2}$$

$$2(3x-2)(x-7)$$

5)  $15x^2 + x - 2$  30

*diff*

$$\frac{15x^2}{5x} - \frac{5x}{5x} + \frac{6x}{2} - \frac{2}{2}$$

1	30
2	15
3	10
-5	+6

$$\frac{5x(3x-1)}{3x-1} + \frac{2(3x-1)}{3x-1}$$

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

6a)  $25x^2 - 64$  30

$$(5x+8)(5x-8)$$

6b)  $a^2 - b^2$

$$(a+b)(a-b)$$

7)  $-12n^2 + 22n + 20$  60

*diff*

$$-2[6n^2 - 11n - 10]$$

1	60
2	30
3	20
+4	-15
5	12
6	10

$$\frac{6n^2}{2n} + \frac{4n}{2n} - \frac{15n}{-5} - \frac{10}{-5}$$

$$\frac{2n(3n+2)}{3n+2} - \frac{5(3n+2)}{3n+2}$$

$$(3n+2)(2n-5)$$

8)  $5x^2 + 17x + 6$  30

*sum*

$$\frac{5x^2}{x} + \frac{2x}{x} + \frac{15x}{3} + \frac{6}{3}$$

1	30
+2	+15
3	10
5	6

$$\frac{x(5x+2)}{5x+2} + \frac{3(5x+2)}{5x+2}$$

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

9)  $3x^2 - 14x + 16$  48

sum ←

1	48
2	24
3	16
4	12
-6	-8

$$\frac{3x^2}{3x} - \frac{6x}{3x} - \frac{8x}{-2} + \frac{16}{-2}$$

$$\frac{3x(x-2)}{x-2} - \frac{2(x-2)}{x-2}$$

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

13)  $4x^2 - 7x - 15$  60

diffs ↓

1	60
2	30
3	20
4	15
+5	-12
6	10

$$\frac{4x^2}{x} + \frac{5x}{x} - \frac{12x}{-3} - \frac{15}{-3}$$

$$\frac{x(4x+5)}{4x+5} - \frac{3(4x+5)}{4x+5}$$

$(4x+5)(x-3)$

10a)  $k^2 - 36$

10b)  $16a^2 - 9$

$(k+6)(k-6)$

$(4a+3)(4a-3)$

14)  $\frac{24a^2}{6a} - \frac{6a}{6a} - \frac{4a}{-1} + \frac{1}{-1}$

$$\frac{6a(4a-1)}{4a-1} - \frac{1(4a-1)}{4a-1}$$

$(4a-1)(6a-1)$

11)  $\frac{-12x^2}{-4} + \frac{44x}{-4} - \frac{24}{-4}$

Hint: Factor out +1 from last two terms.

$-4[3x^2 - 11x + 8]$  24

sum ←

1	24
2	12
-3	-8
4	6

$$\frac{3x^2}{3x} - \frac{3x}{3x} - \frac{8x}{-8} + \frac{8}{-8}$$

$$\frac{3x(x-1)}{x-1} - \frac{8(x-1)}{x-1}$$

$-4(x-1)(3x-8)$

15)  $\frac{3n^2}{n} - \frac{4nv}{n} + \frac{3n}{1} - \frac{4v}{1}$

$$\frac{n(3n-4v)}{3n-4v} + \frac{1(3n-4v)}{3n-4v}$$

$(3n-4v)(n+1)$

12)  $\frac{-5x^2}{-1} + \frac{29x}{-1} - \frac{20}{-1}$

Hint: Factor out -1.

$-1[5x^2 - 29x + 20]$  100

sum ←

1	100
2	50
-4	-25
5	20
10	10

$$\frac{5x^2}{x} - \frac{4x}{x} - \frac{25x}{-5} + \frac{20}{-5}$$

$$x(5x-4) - 5(5x-4)$$

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

16)  $\frac{-16x^2}{-2} - \frac{28x}{-2} + \frac{18}{-2}$

diffs ↓

1	72
2	36
3	24
-4	+18
6	12
8	9

$$\frac{8x^2}{4x} - \frac{4x}{4x} + \frac{18x}{9} - \frac{9}{9}$$

$$\frac{4x(2x-1)}{2x-1} + \frac{9(2x-1)}{2x-1}$$

$-2(2x-1)(4x+9)$