

NOME Francesca Camilla

COGNOME Gentile

INDIRIZZO

TELEFONO

EMAIL

SCUOLA Liceo scientifico IA

CLASSE

MATERIA MATEMATICA 

ANNO SCOLASTICO 2023/2024

NUMERI NATURALI

P. 31

n. 152

$$\begin{aligned} & 2 \cdot 3^2 + 5 - 10 : 2 = \\ & = 2 \cdot 9 + \cancel{5} - \cancel{5} \\ & = 18 \end{aligned}$$

n. 153

$$\begin{aligned} & 4^2 : 8 + 2 \cdot 3 + 100 : 10 = \\ & = 16 : 8 + 6 + 10 = \\ & = 2 + 6 + 10 = \\ & = 18 \end{aligned}$$

n. 154

$$\begin{aligned} & 24 : 8 + 2^2 - 1 \cdot 2 = \\ & = 3 + 4 - 2 = \\ & = 5 \end{aligned}$$

n. 155

$$\begin{aligned} & 2 \cdot 5 + 18 : 9 - 14 : 7 + 2 \cdot 3^2 = \\ & = 10 + \cancel{2} - \cancel{2} + 2 \cdot 9 = \\ & = 10 + 18 = \\ & = 28 \end{aligned}$$

n. 156

$$\begin{aligned} & 5^2 - 4^2 : 2 - 9 \cdot 2 = \\ & = 25 - 16 : 2 - 8 = \\ & = 25 - 8 - 8 = \\ & = 9 \end{aligned}$$

n. 157

$$\begin{aligned} & 18 - 15 : 5 - 35 : 7 + 4 \cdot 2^3 = \\ & = 18 - 3 - 5 + 4 \cdot 8 = \\ & = 10 + 32 = \\ & = 42 \end{aligned}$$

n. 158

$$\begin{aligned} & 125 : 5^2 + 12^2 : 6 \cdot 2 - 3^2 = \\ & = 125 : 25 + 144 : 6 \cdot 2 - 9 = \\ & = 5 + 24 \cdot 2 - 9 = \\ & = 5 + 48 - 9 = \\ & = 44 \end{aligned}$$

n. 159

$$\begin{aligned} & 3 + 3^2 \cdot 2 - 20 : 5 : 2 = \\ & = 3 + 9 \cdot 2 - 4 : 2 = \\ & = 3 + 18 - 2 = \\ & = 19 \end{aligned}$$

n. 160

$$\begin{aligned} & 90 : 9 : 2 + 90 \cdot 2 : 9 + 90 : 9 \cdot 2 = \\ & = 10 : 2 + 180 : 9 + 20 = \\ & = 5 + 20 + 20 = \\ & = 45 \end{aligned}$$

n. 161

$$\begin{aligned} & 12^2 \cdot 2^2 : 3^2 + 12^2 : 2^2 \cdot 3 - 12^2 : 2^2 : 3 = \\ & = 144 \cdot 4 : 9 + 144 : 4 \cdot 3 - 144 : 4 : 3 = \\ & = 64 + 108 - 12 = \\ & = 160 \end{aligned}$$

n. 162

$$\begin{aligned} & 81^2 : 9^2 - 36 : 3 \cdot 2 - 36 : 2 \cdot 3 = \\ & = 6561 : 81 - 24 - 54 = \\ & = 3 \end{aligned}$$

P. 32

n. 167

$$\begin{aligned} & 80 - 2 \cdot [15 : 5 + 3 \cdot (4 \cdot 5^2 - 9^2) - 5^2] = \\ & = 80 - 2 \cdot [3 + 3 \cdot (4 \cdot 25 - 81) - 25] = \\ & = 80 - 2 \cdot [3 + 3 \cdot (100 - 81) - 25] = \\ & = 80 - 2 \cdot [3 + 3 \cdot 19 - 25] = \\ & = 80 - 2 \cdot [3 + 57 - 25] = \\ & = 80 - 2 \cdot [35] = \\ & = 80 - 2 \cdot 35 = \\ & = 80 - 70 = \\ & = 10 \end{aligned}$$

n. 168

$$\begin{aligned} & \{ [(7-5)^2 + (4-3)^2] - 9 \} : 4 = \\ & = \{ [4 + 1] - 9 \} : 4 = \\ & = \{ 25 - 9 \} : 4 = \\ & = 16 : 4 = \\ & = 4 \end{aligned}$$

n. 169

$$\begin{aligned} & 25 - (2+5) \cdot 3 + 25 - 5 \cdot (4+1) - 12 : 6 = \\ & = 25 - 7 \cdot 3 + 25 - 25 - 2 = \\ & = 25 - 21 - 2 = \\ & = 2 \end{aligned}$$

n. 170

$$\begin{aligned} & [24 : (2+3 \cdot 2) + 100 : (2^2+4^2)] \cdot (120 : 10) = \\ & = [24 : 8 + 100 : (20)] \cdot 12 = \\ & = [3 + 5] \cdot 12 = \\ & = 8 \cdot 12 = \\ & = 96 \end{aligned}$$

$$(2+24:6):3+4^2:(2^2 \cdot 3+6)+8-6=$$

$$= 6:3+16:16+8-6=$$

$$= 2+1+2=$$

$$= 5$$

n. 172

$$[(5-50:25) \cdot (100:10-6^2:9)-(5 \cdot 2^2-17)]:5=$$

$$= [3 \cdot (10-9) - (20-17)]:5=$$

$$= [3 \cdot 6 - 3]:5=$$

$$= 3$$

n. 173

$$(3 \cdot 9 - 18:6) - (4 \cdot 3 - 25:5) =$$

$$= (27 - 3) - (12 - 5) =$$

$$= 24 - 7 =$$

$$= 17$$

n. 174

$$3 \cdot 9 - (18:6 + 4 \cdot 3) - 144:12:6 =$$

$$= 27 - (3 + 12) - 2 =$$

$$= 27 - 15 - 2 =$$

$$= 10$$

n. 175

$$12 - 15:3 - [120:10:2 - (7-5)] =$$

$$= 12 - 5 - [6 - 2] =$$

$$= 12 - 5 - 4 =$$

$$= 3$$

n. 176

$$[(7-5)^2 + 5]^2 : 9 : 3 + 150 : (6 \cdot 3 - 3) =$$

$$= [9]^2 : 9 : 3 + 150 : 15 =$$

$$= 81 : 9 : 3 + 10 =$$

$$= 13$$

n. 77

$$\begin{aligned} & (6G : 8 : 2 - 6G : 8 : 2)^2 - [2G : (8 : 2 - 6G : 8 : 2)] = \\ & = (16 - G)^2 - [2G : (16 - G)] = \\ & = 1GG - [2G : 12] = \\ & = 1GG - 2 = \\ & = 1G2 \end{aligned}$$

n. 75

$$\begin{aligned} & (8^7)^2 : (8^2)^6 = \\ & = 8^{14} : 8^{12} = \\ & = 8^2 = 64 \end{aligned}$$

n. 80

$$\begin{aligned} & (3^4 \cdot 3^5)^2 : (3^3)^5 = \\ & = (3^9)^2 : 3^{15} = \\ & = 3^{18} : 3^{15} = \\ & = 3^3 = 27 \end{aligned}$$

n. 85

$$(10^5)^7 = 10^{35}$$

n. 170

$$\begin{aligned} & [24 : (2+3 \cdot 2) + 100 : (2^2+4^2)] \cdot (120 : 10) = \\ & = [24 : (2+6) + 100 : (4+16)] \cdot 12 = \\ & = [24 : 8 + 100 : 20] \cdot 12 = \\ & = [3 + 5] \cdot 12 = \\ & = 8 \cdot 12 = \\ & = 96 \end{aligned}$$

n. 175

$$\begin{aligned} & 12 - 15 : 3 - [120 : 10 : 2 - (7-5)] = \\ & = 12 - 15 : 3 - [120 : 10 : 2 - 2] = \\ & = 12 - 15 : 3 - [12 : 2 - 2] = \\ & = 12 - 15 : 3 - [6 - 2] = \\ & = 12 - 15 : 3 - 4 = \\ & = 12 - 5 - 4 = \\ & = 3 \end{aligned}$$

n. 180

$$\begin{aligned} & (2^{14} - 2^{12} - 2^{10}) : 2^{10} = \\ & = (2^{14} : 2^{10} - 2^{12} : 2^{10} - 2^{10} : 2^{10}) = \\ & = 2^4 - 2^2 - 2^0 = \\ & = 16 - 4 - 1 = \\ & = 11 \end{aligned}$$

n. 185

$$\begin{aligned} & [5^2 \cdot 125^3 - 25^3 \cdot 125 + (5^5)^2] : 5^8 = \\ & = [5^2 \cdot (5^3)^3 - (5^2)^3 \cdot (5^3 + 5^{10})] : 5^8 = \\ & = [5^2 \cdot 5^9 - 5^6 \cdot 5^3 + 5^{10}] : 5^8 = \\ & = [5^{11} - 5^9 + 5^{10}] : 5^8 = \\ & = [5^{11} : 5^8 - 5^9 : 5^8 + 5^{10} : 5^8] = \\ & = 5^3 - 5 + 5^2 = \\ & = 125 - 5 + 25 = 145 \end{aligned}$$

n. 195

$$\begin{aligned} & 12 : (3^2 - 2^6 : 2^3 + 2^0) - 10 : [(5^2)^0 \cdot 5^2 - 2^2 \cdot 5] = \\ & = 12 : (3^2 - 2^3 + 1) - 10 : [1 \cdot 5^2 - 20] = \\ & = 12 : (9 - 8 + 1) - 10 : [25 - 20] = \\ & = 12 : 2 - 10 : 5 = \\ & = 6 - 2 = \\ & = 4 \end{aligned}$$

n. 200

$$\begin{aligned} & [(3^2 - 2^4 : 2^2)^2 \cdot 5^{10}] : (5^5)^2 - (5 \cdot 2)^4 : [(10^5 \cdot 10^4) : 10^9] - 10 \cdot 11^0 = \\ & = [(3^2 - 2^2)^2 \cdot 5^{10}] : 5^{10} - 5^4 \cdot 2^4 : [10^9 : 10^9] - 10 \cdot 1 = \\ & = [(9 - 4)^2 \cdot 5^{10}] : 5^{10} - 10^4 : 10^0 - 10 = \\ & = [5^2 \cdot 5^{10}] : 5^{10} - 10^4 : 10^0 - 10 = \\ & = 5^2 : 5^{10} - 10^4 : 10^0 - 10 = \\ & = 5^2 - 10^0 - 10 = \\ & = 25 - 1 - 10 = \\ & = 14 \end{aligned}$$

n. 205

$$\begin{aligned} & [(3^7 : 3^4 \cdot 3^5)^2 : (3^4 \cdot 3^7 : 3^9)^6] : 9 - 2^{11} : (2^4)^2 = \\ & = [(3^3 \cdot 3^5)^2 : (3^{11} : 3^9)^6] : 9 - 2^{11} : 2^8 = \\ & = [(3^8)^2 : (3^2)^6] : 9 - 2^{11} : 2^8 = \\ & = [3^{16} : 3^{12}] : 9 - 2^{11} : 2^8 = \\ & = 3^4 : 3^2 - 2^3 = \\ & = 3^2 - 2^3 = \\ & = 9 - 8 = \\ & = 1 \end{aligned}$$

n. 210

$$\begin{aligned} & [(3^{24} : 3^{12} : 3^3 : 3^2 : 3) : (3^{23} : 3^{12} : 3^3 : 3^2 : 3)] : [(3^{24} \cdot 2^{14} \cdot 2^4 \cdot 2^2) : (3^{23} \cdot 2^{14} \cdot 2^4 \cdot 2^2)] \\ &= [(3^6) : (3^5)] : [(3^{24} \cdot 2^{20}) : (3^{23} \cdot 2^{20})] = \\ &= 3 : [3^{24} \cdot 2^{20}] : [3^{23} \cdot 2^{20}] = \\ &= 3 : [3 \cdot 2^0] = \\ &= 3 : [3 \cdot 1] = \\ &= 3 : 3 = \\ &= 1 \end{aligned}$$

SCOMPOSIZIONE in fattori primi

$$\begin{array}{r|l} 400 & 2 \cdot 5^2 \\ 4 & 2 \\ 2 & 2 \\ 1 & \end{array}$$

$$400 = 2^4 \cdot 5^2$$

$$\begin{array}{r|l} 360 & 2 \cdot 3 \\ 36 & 2 \\ 18 & 2 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$$360 = 2^3 \cdot 3^2 \cdot 5$$

NUMERI PRIMI FINO A 100

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61,
67, 71, 73, 79, 83, 89, 97

COMPITI

P. 81 n. 161

$$\begin{aligned} & 12^2 \cdot 2^2 : 3^2 + 12^2 : 2^2 \cdot 3 - 12^2 : 2^2 : 3 = \\ & = 24^2 : 3^2 + 6^2 \cdot 3 - 6^2 : 3 = \\ & = 576 : 9 + 36 \cdot 3 - 36 : 3 = \\ & = 64 + 108 - 12 = \\ & = 160 \end{aligned}$$

n. 171

$$\begin{aligned} & (2 + 24 : 6) : 3 + 4^2 : (2^2 \cdot 3 + 4) + 8 - 6 = \\ & = (2 + 4) : 3 + 4^2 : (4 \cdot 3 + 4) + 8 - 6 = \\ & = 6 : 3 + 4^2 : 16 + 8 - 6 = \\ & = 2 + 1 + 8 - 6 = \\ & = 5 \end{aligned}$$

n. 176

$$\begin{aligned} & [(7-5)^2 + 5]^2 : 9 : 3 + 150 : (6 \cdot 3 - 3) = \\ & = [4 + 5]^2 : 9 : 3 + 150 : 15 = \\ & = 9^2 : 9 : 3 + 150 : 15 = \\ & = (3^2)^2 : 9 : 3 + 150 : 15 = \\ & = 3^4 : 3^2 : 3 + 10 = \\ & = 3 + 10 = \\ & = 13 \end{aligned}$$

n. 181

$$\begin{aligned} & (4^6 + 5 \cdot 8^3 - 3 \cdot 16^2) : 2^8 = \\ & = (4^6 + 5(2^3)^3 - 3 \cdot (2^4)^2) : 2^8 = \\ & = (4^6 + 5 \cdot 2^9 - 3 \cdot 2^8) : 2^8 = \\ & = (2^{12} + 5 \cdot 2^9 - 3 \cdot 2^8) : 2^8 = \\ & = (2^{12} + 5 \cdot 2 - 3) : 2^8 = \\ & = (2^{12} + 10 - 3) : 2^8 = \\ & = (2^{12} + 7) : 2^8 = \\ & = 2^4 + 7 = \\ & = 16 + 7 = \\ & = 23 \end{aligned}$$

n. 186

$$\begin{aligned} & (200 \times 10^6 - 3000 \cdot 10^3 + 10^7) : 10^5 = \\ & = (200 \times 10^6 - 3 \cdot 10^3 \cdot 10^3 + 10^7) : 10^5 = \\ & = (200 \times 10^6 - 3 \cdot 10^6 + 10^7) : 10^5 = \\ & = (2 \cdot 10^2 \times 10^6 - 3 \cdot 10^6 + 10^7) : 10^5 = \\ & = (2 \cdot 10^8 - 3 \cdot 10^6 + 10^7) : 10^5 = \\ & = \frac{2 \cdot 10^8}{10^5} - \frac{3 \cdot 10^6}{10^5} + 10^2 = 2 \cdot 10^3 - 3 \cdot 10 + 10^2 = 2000 - 30 + 100 = 2070 \end{aligned}$$

n. 191

$$\begin{aligned} & \{ [(2^3 \cdot 2^5) : 2^6 - 2^0] \cdot (3^2)^3 \} : 3^5 = \\ & = \{ [2^2 - 1] \cdot 3^6 \} : 3^5 = \\ & = \{ 3 \cdot 3^6 \} : 3^5 = \\ & = 3^7 : 3^5 = \\ & = 3^2 = \\ & = 9 \end{aligned}$$

n. 196

$$\begin{aligned} & \{ [8^{15} : 4^6] : 2^{10} - (3^{10} : 3^4)^2 : (3^6)^2 \} (2^8 : 2^6 : 2^2 - 2^0) = \\ & = \{ [(2^3)^{15} : (2^2)^6] : 2^{10} - (3^6)^2 : 3^{12} \} = \\ & = \{ [2^{45} : 2^{12}] : 2^{10} - 0 \} = \\ & = \{ 2^{33} : 2^{10} - 1 \} = \\ & = \{ 2^{23} - 0 \} = \\ & = \{ 2^{23} \} = \\ & = 2^0 = \\ & = 1 \end{aligned}$$

n. 201

$$\begin{aligned} & \{ [(3 \cdot 2^2 - 5) \cdot 7^5] : 7^6 - [(2 \cdot 3^2 - 13) \cdot 5^2] : (5^2)^2 \} : [6^0 + 5^7 : (5^3)^2] = \\ & = \{ [7 \cdot 7^5] : 7^6 - [(5^4) \cdot 5^2] : 5^6 \} : [1 + 5^7 : 5^6] = \\ & = \{ 7^6 : 7^6 - [5^6] : 5^6 \} : [1 + 5] = \\ & = \{ 7^2 - 5^2 \} : 6 = \\ & = \{ 49 - 25 \} : 6 = \\ & = 24 : 6 = \\ & = 4 \end{aligned}$$

n. 206

$$\begin{aligned} & \{ [(15^5 : 5^5)^2 : 3^8] : 3^7 - 5^2 \}^{11} : [(2^4 \cdot 2^6)^3 : (2^{22} \cdot 2^0)] = \\ & = \{ [(3^5)^2 : 3^8] : 3^7 - 5^2 \}^{11} : [2^{30} : 2^{22}] = \\ & = \{ [3^{10} : 3^8] : 3^7 - 5^2 \}^{11} : 2^8 = \\ & = \{ (3^2)^5 : 3^7 - 5^2 \}^{11} : 2^8 = \\ & = \{ 3^{10} : 3^7 - 5^2 \}^{11} : 2^8 = \\ & = \{ 3^3 - 5^2 \}^{11} : 2^8 = \\ & = \{ 27 - 25 \} : 2^8 = \\ & = 2^{11} : 2^8 = \\ & = 2^3 = 8 \end{aligned}$$

n 2-11

$$\begin{aligned} & \left[\frac{2^{10} \cdot (2^4)^9}{(2^9)^2} : \frac{(4^9 \cdot (4^4)^2)}{(4^7)^2} \right]^3 - \left[\frac{3^{11} \cdot (3^5)^{10}}{(3^{20})^2} : \frac{9^{11} \cdot (9^3)^2}{(98)^2} \right]^2 = \\ & = \left[\frac{2^{10} \cdot 2^{36}}{2^{38}} : \frac{4^9 \cdot 4^8}{4^{14}} \right]^3 - \left[\frac{3^{11} \cdot 3^{50}}{3^{40}} : \frac{9^{11} \cdot 9^{15}}{9^{16}} \right]^2 = \\ & = \left[\frac{2^{46}}{2^{38}} : \frac{4^{17}}{4^{14}} \right]^3 - \left[\frac{3^{61}}{3^{40}} : \frac{9^{26}}{9^{16}} \right]^2 = \\ & = \left[2^8 : 4^3 \right]^3 - \left[3^{21} : 9^{10} \right]^2 = \\ & = \left[2^8 : (2^2)^3 \right]^3 - \left[3^{21} : (3^2)^{10} \right]^2 = \\ & = \left[2^8 : 2^6 \right]^3 - \left[3^{21} : 3^{20} \right]^2 = \\ & = \left[2^2 \right]^3 - \left[3^1 \right]^2 = \\ & = 2^6 - 3^{1 \cdot 2} = \\ & = 64 - 9 = \\ & = 55 \end{aligned}$$

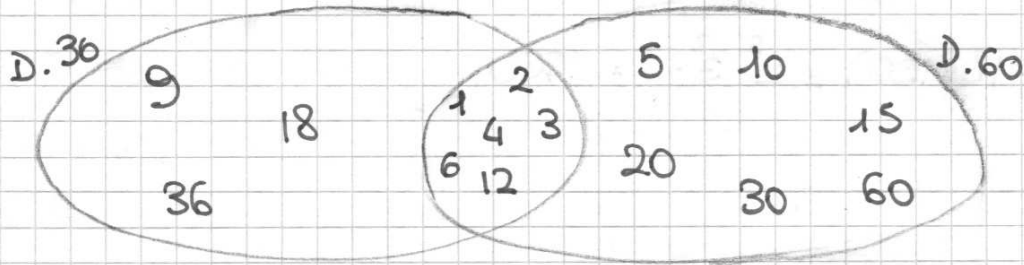
Massimo comune divisore MCD

36; 60

$$D_{36} = \{1, 2, 3, 4, 6, 9, 12, 18, 36\}$$

$$D_{60} = \{1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60\}$$

12



Minimo comune multiplo m.c.m.

4; 6

$$M_4 = \{4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48\}$$

12

$$M_6 = \{6, 12, 18, 24, 30, 36, 42\}$$

Esercizi

$$\text{MCD}(48, 60, 28) = 2^2 = 4$$

$$\begin{array}{r|l} 48 & 2 \\ 24 & 2 \\ 12 & 2 \\ 6 & 2 \\ 3 & 3 \\ 1 & \end{array}$$

$$\begin{array}{r|l} 60 & 2 \cdot 5 \\ 6 & 2 \\ 3 & 3 \\ 1 & \end{array}$$

$$\begin{array}{r|l} 28 & 2 \\ 14 & 2 \\ 7 & 7 \\ 1 & \end{array}$$

$$48 = 2^4 \cdot 3$$

$$60 = 2^2 \cdot 3 \cdot 5$$

$$28 = 2^2 \cdot 7$$

$$\text{m.c.m.}(48, 60, 28) = 2^4 \cdot 3 \cdot 5 \cdot 7 = 1680$$

$$\text{MCD}(40; 18; 160) = 2$$

$$\begin{array}{r|l} 40 & 2 \cdot 5 \\ 2 & 2 \\ 2 & 2 \\ 1 & \end{array}$$

$$\begin{array}{r|l} 18 & 2 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$$\begin{array}{r|l} 160 & 2 \cdot 5 \\ 16 & 2 \cdot 5 \\ 8 & 2 \\ 4 & 2 \\ 2 & 2 \\ 1 & \end{array}$$

$$40 = 2^3 \cdot 5$$

$$18 = 2 \cdot 3^2$$

$$160 = 2^5 \cdot 5$$

$$\text{mcm} = (40; 18; 160) = 2^5 \cdot 3^2 \cdot 5 = 1440$$

$$40 = 2^3 \cdot 5$$

$$18 = 2 \cdot 3^2$$

$$160 = 2^5 \cdot 5$$

$$\text{MCD}(36, 30, 90) = 6$$

$$\begin{array}{r|l} 36 & 2 \\ 18 & 2 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$$\begin{array}{r|l} 30 & 2 \cdot 5 \\ 3 & 3 \\ 1 & \end{array}$$

$$\begin{array}{r|l} 90 & 2 \cdot 5 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$$36 = 2^2 \cdot 3^2$$

$$30 = 2 \cdot 3 \cdot 5$$

$$90 = 2 \cdot 3^2 \cdot 5$$

$$\text{mcm}(36, 30, 90) = 180$$

$$36 = 2^2 \cdot 3^2$$

$$30 = 2 \cdot 3 \cdot 5$$

$$90 = 2 \cdot 3^2 \cdot 5$$

P. 33 n. 182

$$\begin{aligned} & (25^{10} + 2 \cdot 125^6 - 5^{17}) : 5^{17} = \\ & = [(5^2)^{10} + 2 \cdot (5^3)^6 - 5^{17}] : 5^{17} = \\ & = [5^{20} + 2 \cdot 5^{18} - 5^{17}] : 5^{17} = \\ & = 5^3 + 2 \cdot 5 - 1 = \\ & = 125 + 10 - 1 = \\ & = 135 - 1 = \\ & = 134 \end{aligned}$$

$$\begin{aligned} & (9 \cdot 2^{13}) : (2 \cdot 2^{10} + 1 \cdot 2^{10}) = \\ & = (3^2 \cdot 2^{13}) : (3 \cdot 2^{10}) = \\ & = 3 \cdot 2^3 = \\ & = 3 \cdot 8 = 24 \end{aligned}$$

n. 192

$$\begin{aligned} & \{ [(2^3)^5 : 2^{11} - 3^2 - 2^2]^5 \cdot 3^9 \} : (3^6)^2 = \\ & = \{ [2^{15} : 2^{11} - 3^2 - 2^2]^5 \cdot 3^9 \} : 3^{12} = \\ & = \{ [2^4 - 3^2 - 2^2]^5 \cdot 3^9 \} : 3^{12} = \\ & = \{ [16 - 9 - 4]^5 \cdot 3^9 \} : 3^{12} = \\ & = \{ 3^5 \cdot 3^9 \} : 3^{12} = \\ & = 3^{14} : 3^{12} = \\ & = 3^2 = \\ & = 9 \end{aligned}$$

n. 197

$$\begin{aligned} & (3^2 + 2^2 + 5^2 - 4^2) : 2 + (5^7 \cdot 5^{11})^2 : (5^5)^7 - (4^3 \cdot 4^6) : 2^{16} = \\ & = (9 + 4 + 25 - 16) : 2 + (5^{18})^2 : 5^{35} - 4^9 : 2^{16} = \\ & = 22 : 2 + 5^{36} : 5^{35} - (2^2)^9 : 2^{16} = \\ & = 11 + 5 - 2^{18} : 2^{16} = \\ & = 11 + 5 - 2^2 = \\ & = 11 + 5 - 4 = \\ & = 12 \end{aligned}$$

n. 202

$$\begin{aligned} & \{ [8^2 \cdot (2^3 \cdot 8^3)^2] : 2^{18} \}^2 : (8^4 \cdot 8^2) - 8^4 : (2^6)^2 - (5^{17} : 5^{12})^2 : 5^8 = \\ & = \{ [8^2 \cdot (2^3 \cdot (2^3)^3)^2] : 2^{18} \}^2 : 8^6 - 8^4 : 2^{10} - (5^5)^2 : 5^8 = \\ & = \{ [(2^3)^2 \cdot (2^3 \cdot 2^9)^2] : 2^{18} \}^2 : (2^3)^6 - (2^3)^4 : 2^{10} - 5^{10} : 5^8 = \\ & = \{ [2^6 \cdot (2^{12})^2] : 2^{18} \}^2 : 2^{18} - 2^{12} : 2^{10} - 5^2 = \\ & = \{ [2^6 \cdot 2^{24}] : 2^{18} \}^2 : 2^{18} - 2^{12} : 2^{10} - 5^2 = \\ & = \{ 2^{30} : 2^{18} \}^2 : 2^{18} - 2^{12} : 2^{10} - 5 = \\ & = \{ 2^{12} \}^2 : 2^{18} - 2^{12} - 5^2 = \\ & = 44 \cdot 2^6 - 2^{12} - 5^2 = \\ & = 64 - 4 - 5^2 = \\ & = 64 - 4 - 25 = \\ & = 35 \end{aligned}$$

n. 207

$$\begin{aligned} & [(3^2 \cdot 2^2)^5 : 6^8] - \{ [(16^3)^2 : (2^5)^4] \cdot 2^9 \} : 9^5 - (2^4 \cdot 5^2)^0 = \\ & = [(6^2)^5 : 6^8] - \{ [16^6 : 2^{20}] \cdot 2^9 \} : 9^5 - 1 = \\ & = [6^{10} : 6^8] - \{ [(2^4)^6 : 2^{20}] \cdot 2^9 \} : (2^2)^5 - 1 = \\ & = 6^2 - \{ [2^{24} : 2^{20}] \cdot 2^9 \} : 2^{10} - 1 = \\ & = 6^2 - \{ 2^4 \cdot 2^9 \} : 2^{10} - 1 = \\ & = 6^2 - 2^{13} : 2^{10} - 1 = \\ & = 36 - 2^3 - 1 = \\ & = 36 - 8 - 1 = \\ & = 27 \end{aligned}$$

n. 212

$$\begin{aligned} & \left\{ \frac{(5 + 5^0 + 5^2)^{11}}{[(7 \cdot 5 - 2^2)^5]^2} - (5^0 + 3^3) : [(7^3 \cdot 7^4) : (7^2)^3] \right\}^{10} : (3^4)^6 = \\ & = \left\{ \frac{(5 + 1 + 25)^{11}}{[(35 - 4)^5]^2} - (1 + 27) : [(7^7) : 7^6] \right\}^{10} : 3^{28} = \\ & = \left\{ \frac{31^{11}}{31^{10}} - 28 : [7] \right\}^{10} : 3^{28} = \\ & = \left\{ \frac{31^{11}}{31^{10}} - 28 \right\}^{10} : 3^{28} = \\ & = \left\{ 31 - 28 \right\}^{10} : 3^{28} = \\ & = 27^{10} : 3^{28} = \\ & = (3^3)^{10} : 3^{28} = \\ & = 3^{30} : 3^{28} = \\ & = 3^2 = \\ & = 9 \end{aligned}$$

P. 37 n. 275

$$\begin{aligned}(18^4 \cdot 24) : 36^3 &= \\ &= [(2 \cdot 3^2)^4 \cdot (2^3 \cdot 3)] : (2^2 \cdot 3^2)^3 = \\ &= [(2^4 \cdot 3^8) \cdot (2^3 \cdot 3)] : (2^6 \cdot 3^6) = \\ &= [2^7 \cdot 3^9] : (2^6 \cdot 3^6) = \\ &= 2 \cdot 3^3 = \\ &= 2 \cdot 27 = \\ &= 54\end{aligned}$$

n. 280

$$\begin{aligned}(81^2 \cdot 54^3 \cdot 2) : (18 \cdot 9)^4 &= \\ &= [(3^4)^2 \cdot (2 \cdot 3^3)^3 \cdot 2] : (2 \cdot 3^2 \cdot 3^2)^4 = \\ &= [3^8 \cdot 2^3 \cdot 3^9 \cdot 2] : (2 \cdot 3^4)^4 = \\ &= [3^{17} \cdot 2^4] : (2^4 \cdot 3^{16}) = \\ &= 3 \cdot 2^0 = \\ &= 3\end{aligned}$$

n. 285

$mcm(4; 8) = 8$	$mcm(15; 10) = 30$	$mcm(25; 20; 10) = 100$
$4 = 2^2$	$15 = \underline{3} \cdot \underline{5}$	$25 = \underline{5}^2$
$8 = \underline{2}^3$	$10 = \underline{2} \cdot \underline{5}$	$20 = \underline{2}^2 \cdot \underline{5}$

n. 290

$MCD(66, 11, 110) = \underline{11}$	$mcm = 220$
$66 \begin{array}{l} 2 \\ 22 \end{array} \begin{array}{l} 2 \\ 11 \end{array} \begin{array}{l} 11 \\ 1 \end{array}$	$66 = 2^2 \cdot \underline{11}$
	$11 = \underline{11}$
	$110 = 2 \cdot \underline{5} \cdot \underline{11}$
$110 \begin{array}{l} 2 \cdot 5 \\ 11 \end{array} \begin{array}{l} 11 \\ 1 \end{array}$	$110 = 2 \cdot \underline{5} \cdot \underline{11}$

n. 295

$$\text{MCD}(12, 66, 60) = 6$$

$$12 = 2^2 \cdot \underline{3}$$

$$66 = \underline{2} \cdot 3 \cdot 11$$

$$60 = 2^2 \cdot 3 \cdot \underline{5}$$

$$\text{mcm} = 660$$

$$12 = 2^2 \cdot \underline{3}$$

$$66 = 2 \cdot 3 \cdot \underline{11}$$

$$60 = 2^2 \cdot 3 \cdot \underline{5}$$

n. 300

$$\text{MCD}(110, 120, 130) = 10$$

$$110 = \underline{2} \cdot \underline{5} \cdot 11$$

$$120 = 2^3 \cdot 3 \cdot 5$$

$$130 = 2 \cdot 5 \cdot 13$$

$$\text{mcm} = 17160$$

$$110 = 2 \cdot \underline{5} \cdot \underline{11}$$

$$120 = \underline{2}^3 \cdot \underline{3} \cdot 5$$

$$130 = 2 \cdot 5 \cdot \underline{13}$$

P. 38 n. 294

$$\begin{array}{r|l} 36 & 2 \\ 18 & 2 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$$\begin{array}{r|l} 72 & 2 \\ 36 & 2 \\ 18 & 2 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$$\begin{array}{r|l} 126 & 2 \\ 63 & 3 \\ 21 & 3 \\ 7 & 7 \\ 1 & \end{array}$$

$$\text{MCD}(36, 72, 126) = 2 \cdot 3^2 = 18$$

$$\text{mcm}(36, 72, 126) = 2^3 \cdot 3^2 \cdot 7 = 504$$

$$36 = 2^2 \cdot 3^2$$

$$72 = 2^3 \cdot 3^2$$

$$126 = 2 \cdot 3^2 \cdot 7$$

n. 296

$$55 = 5 \cdot 11$$

$$100 = 2^2 \cdot 5^2$$

$$25 = 5^2$$

$$\text{MCD}(55, 100, 25) = 5$$

$$\text{mcm}(55, 100, 25) = 2^2 \cdot 5^2 \cdot 11 = 1100$$

n. 298

$$30 = 2 \cdot 3 \cdot 5$$

$$33 = 3 \cdot 11$$

$$35 = 5 \cdot 7$$

$$\text{MCD}(30, 33, 35) = 1$$

$$\text{mcm}(30, 33, 35) = 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 = 2310$$

n. 300

$$110 = 2 \cdot 5 \cdot 11$$

$$120 = 2^3 \cdot 3 \cdot 5$$

$$130 = 2 \cdot 5 \cdot 13$$

$$\text{MCD}(110, 120, 130) = 2 \cdot 5 = 10$$

$$\text{mcm}(110, 120, 130) = 8 \cdot 5 \cdot 3 \cdot 11 \cdot 13 = 17160$$

n. 302

$$\begin{array}{r|l} 3956 & 2 \\ 1728 & 2 \\ 864 & 2 \\ 432 & 2 \\ 216 & 2 \\ 108 & 2 \\ 54 & 2 \\ 27 & 3 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$$\text{MCD}(3, 9, 3956) = 3$$

$$\text{mcm}(3, 9, 3956) = 3956$$

$$3956 = 2^2 \cdot 3^3$$

$$3 = 3$$

$$9 = 3^2$$

n. 304

$$15 = 3 \cdot 5$$

$$25 = 5^2$$

$$125 = 5^3$$

$$150 = 2 \cdot 3 \cdot 5^2$$

$$\text{MCD} = 5$$

$$\text{mcm} = 750$$

n. 306

$$132 \mid 2$$

$$66 \mid 2$$

$$33 \mid 3$$

$$11 \mid 11$$

$$1 \mid 1$$

$$990 \mid 2 \cdot 5$$

$$99 \mid 3$$

$$33 \mid 3$$

$$11 \mid 11$$

$$1 \mid 1$$

$$891 \mid 3$$

$$297 \mid 3$$

$$99 \mid 3$$

$$33 \mid 3$$

$$11 \mid 11$$

$$1 \mid 1$$

$$132 = 2^2 \cdot 3 \cdot 11$$

$$990 = 2 \cdot 3^2 \cdot 5 \cdot 11$$

$$891 = 3^4 \cdot 11$$

$$\text{MCD} = 33$$

$$\text{mcm} = 2 \cdot 81 \cdot 5 \cdot 11 = 17820$$

n. 308

$$15 \cdot 27 = 405$$

$$25 \cdot 18 = 450$$

$$24 \cdot 16 = 384$$

$$405 \mid 3$$

$$135 \mid 3$$

$$45 \mid 3$$

$$15 \mid 3$$

$$5 \mid 5$$

$$1 \mid 1$$

$$450 \mid 2 \cdot 5$$

$$45 \mid 3$$

$$15 \mid 3$$

$$5 \mid 5$$

$$1 \mid 1$$

$$384 \mid 2$$

$$192 \mid 2$$

$$96 \mid 2$$

$$48 \mid 2$$

$$24 \mid 2$$

$$12 \mid 2$$

$$6 \mid 2$$

$$3 \mid 3$$

$$1 \mid 1$$

$$405 = 3^4 \cdot 5$$

$$450 = 2 \cdot 3^2 \cdot 5^2$$

$$384 = 2^7 \cdot 3$$

$$\text{MCD} = 3$$

$$\text{mcm} = 2^7 \cdot 3^4 \cdot 5^2 = 259200$$

n. 312

$$N_2 = \frac{\text{mcm} \cdot \text{MCD}}{12(N_1)} = \frac{60 \cdot 2}{12} = 10$$

n. 316

$$\text{MCD} = \frac{N_1 \cdot N_2}{\text{mcm}} = \frac{864}{72} = 12$$

P. 33
n. 183

$$\begin{aligned} & (8 \cdot 5^{20}) : (5^{19} - 20 \cdot 5^{17}) = \\ & = (8 \cdot 5^{20}) : (5^{19} - 4 \cdot 5 \cdot 5^{17}) = \\ & = (8 \cdot 5^{20}) : (5^{19} - 4 \cdot 5^{18}) = \\ & = (8 \cdot 5^{20}) : (5 \cdot 5^{18} - 4 \cdot 1 \cdot 5^{18}) = \\ & = (8 \cdot 5^{20}) : (1 \cdot 5^{18}) = \\ & = (8 \cdot 5^{20}) : 5^{18} = \\ & = 8 \cdot 5^2 = \\ & = 200 \end{aligned}$$

n. 188

$$\begin{aligned} & (3^{13} + 3^{10}) : (3^{10} - 2 \cdot 3^8) = \\ & = (3^3 \cdot 3^{10} + 1 \cdot 3^{10}) : (3^{10} - 2 \cdot 3^8) = \\ & = (28 \cdot 3^{10}) : (3^{10} - 2 \cdot 3^8) = \\ & = (28 \cdot 3^{10}) : (3^2 \cdot 3^8 - 2 \cdot 3^8) = \\ & = (28 \cdot 3^{10}) : (7 \cdot 3^8) = \\ & = 4 \cdot 3^2 = \\ & = 4 \cdot 9 = \\ & = 36 \end{aligned}$$

n. 193

$$\begin{aligned} & [(6^2)^3 : 6^6 - 1] : 5 - (2^{11} \cdot 2^3) : 2^{13} - 2^0 = \\ & = [6^6 : 6^6 - 1] : 5 - 2^{14} : 2^{13} - 1 = \\ & = [6^2 - 1] : 5 - 2 - 1 = \\ & = 35 : 5 - 2 - 1 = \\ & = 7 - 2 - 1 = \\ & = 4 \end{aligned}$$

n. 198

$$\begin{aligned} & \{ [(2^2 \cdot 2^5) : 2^6 + (3^3 \cdot 3)^2 : 3^6 - 2^3] \cdot 3^{12} \} : (3^3)^3 - 5^2 - 5^0 = \\ & = \{ [2^7 : 2^6 + (3^4)^2 : 3^6 - 2^3] \cdot 3^{12} \} : 3^9 - 5^2 - 1 = \\ & = \{ [2 + 3^8 : 3^6 - 2^3] \cdot 3^{12} \} : 3^9 - 5^2 - 1 = \\ & = \{ [2 + 3^2 - 2^3] \cdot 3^{12} \} : 3^9 - 5^2 - 1 = \\ & = \{ 3 \cdot 3^{12} \} : 3^9 - 5^2 - 1 = \\ & = 3^{12} : 3^9 - 5^2 - 1 = \\ & = 3^3 - 5^2 - 1 = \\ & = 27 - 25 - 1 = \\ & = 1 \end{aligned}$$

n. 203

$$\begin{aligned} & [8^2 : 3^5 - (3^4 \cdot 81) : 3^6] : \{ [9^{17} \cdot 9^2 \cdot 3^6] : (9^7)^3 \} = \\ & = [(3^4)^2 : 3^5 - (3^4 \cdot 3^4) : 3^6] : \{ [9^{19} \cdot 3^6] : 9^{21} \} = \\ & = [3^8 : 3^5 - 3^8 : 3^6] : \{ [(3^2)^{19} \cdot 3^6] : 9^{21} \} = \\ & = [3^3 - 3^2] : \{ [3^{38} \cdot 3^6] : 9^{21} \} = \\ & = [27 - 9] : \{ 3^{44} : (3^2)^{21} \} = \\ & = 18 : \{ 3^{44} : 3^{42} \} = \\ & = 18 : \{ 3^2 \} = \\ & = 18 : 9 = \\ & = 2 \end{aligned}$$

n. 208

$$\begin{aligned} & \{ [(16^4 : 8^5)^{17} : 2^{16}]^5 : (4^6 - 2^2)^{11} \} : [(2^5 \cdot 2^7)^2 : (2^2 \cdot 2^4)] = \\ & = \{ [(2^{16} : 2^{15})^{17} : 2^{16}]^5 : 2^{12} - 2^2 \}^{11} : [(2^{12})^2 : 2^6] = \\ & = \{ [2^{17} : 2^{16}]^5 : 2^{12} - 2^2 \}^{11} : [2^{24} : 2^6] = \\ & = \{ [2^3]^5 : 2^{12} - 2^2 \}^{11} : 2^{18} = \\ & = \{ 2^{15} : 2^{12} - 2^2 \}^{11} : 2^{18} = \\ & = \{ 2^3 - 2^2 \}^{11} : 2^{18} = \\ & = \{ 4 \}^{11} : 2^{18} = \\ & = (2^2)^{11} : 2^{18} = 2^{22} : 2^{18} = 2^4 = 16 \end{aligned}$$

P. 33

n. 188

$$\begin{aligned}
 & (3 \cdot 9^3 - 3^6 + 3^5 \cdot 9) : 81 = \\
 & = [3 \cdot (3^2)^3 - 3^6 + 3^5 \cdot 3^2] : 81 = \\
 & = [3 \cdot 3^6 - 3^6 + 3^7] : 81 = \\
 & = [3^7 - 3^6 + 3^7] : 81 = \\
 & = [3^7 - 3^6 + 3^7] : 3^4 = \\
 & = 3^3 - 3^2 + 3^3 = \\
 & = 27 - 9 + 27 = \\
 & = 45
 \end{aligned}$$

n. 189

$$\begin{aligned}
 & (121 \cdot 2^{10}) : (4 \cdot 2^{10} + 8 \cdot 2^7 + 2^9) = \\
 & = (121 \cdot 2^{10}) : [12^2 \cdot 2^{10} + 8 \cdot 2^7 + 2^9] = \\
 & = (121 \cdot 2^{10}) : [2^2 \cdot 2^{10} + 2^3 \cdot 2^7 + 2^9] = \\
 & = (121 \cdot 2^{10}) : [2^{12} + 2^{10} + 2^9] = \\
 & = (121 \cdot 2^{10}) : [2^2 \cdot 2^{10} + 1 \cdot 2^{10} + 2^9] = \\
 & = (11^2 \cdot 2^{10}) : [5 \cdot 2^{10} + 2^9] = \\
 & = (11^2 \cdot 2^{10}) : [5 \cdot 2 \cdot 2^9 + 1 \cdot 2^9] = \\
 & = (11^2 \cdot 2^{10}) : [11 \cdot 2^9] = \\
 & = 11 \cdot 2 = \\
 & = 22
 \end{aligned}$$

n. 199

$$\begin{aligned} & (3^2 - 2^6 : 2^4 - 1) \cdot 4^0 + 2^3 - (3^2 \cdot 3^5)^2 : (3^1)^6 = \\ & = (9 - 2^2 - 1) \times 1 + 2^3 - (3^7)^2 : 3^{12} = \\ & = 4 + 2^3 - 3^{14} : 3^{12} = \\ & = 4 + 8 - 3^2 = \\ & = 12 - 9 = \\ & = 3 \end{aligned}$$

n. 199

$$\begin{aligned} & \{ (3^3 - 3^2 + 3 - 3^0) : [(2^4)^2 : (2^1)^3] \} \cdot [(2^7 \cdot 2^8) : 2^{13}] - 10 = \\ & = \{ (27 - 9 + 3 - 1) : [2^8 : 2^6] \} \cdot [2^{15} : 2^{13}] - 10 = \\ & = \{ 20 : 2^2 \} \cdot [2^2] - 10 = \\ & = 5 \cdot 4 - 10 = \\ & = 10 \end{aligned}$$

n. 209

$$\begin{aligned} & (2^8 : 2^6 - 2)^2 - (2^3 \cdot 2^5)^2 : 2^{14} + (125^2 : 5^9 - 5 \cdot 2^1)^2 - 2^{16} : (2^3)^4 = \\ & = (2^2 - 2)^2 - (2^8)^2 : 2^{14} + (5^6 : 5^4 - 5 \cdot 4)^2 - 2^{16} : 2^{12} = \\ & = 2^2 - 2^{16} : 2^{14} + (5^2 - 20)^2 - 2^4 = \\ & = 4 - 4 + (25 - 20)^2 - 2^4 = \\ & = 5^2 - 2^4 = \\ & = 25 - 16 = \\ & = 9 \end{aligned}$$

n. 209

$$\begin{aligned} & \{ [(56 : 8)^4 \cdot 7^9] : (35 : 5)^{11} - (35 : 7)^{2 \cdot 7} \} : (29^3)^2 - 7 \cdot (21^0 + 33^0) = \\ & = \{ [7^6 \cdot 7^9] : 7^{11} - 5^2 \}^7 : 29^6 - 7 \cdot 2 = \\ & = \{ 7^{15} : 7^{11} - 25 \}^7 : 29^6 - 14 = \\ & = \{ 7^2 - 25 \}^7 : 29^6 - 14 = \\ & = 29^7 : 29^6 - 14 = \\ & = 29 - 14 = \\ & = 10 \end{aligned}$$